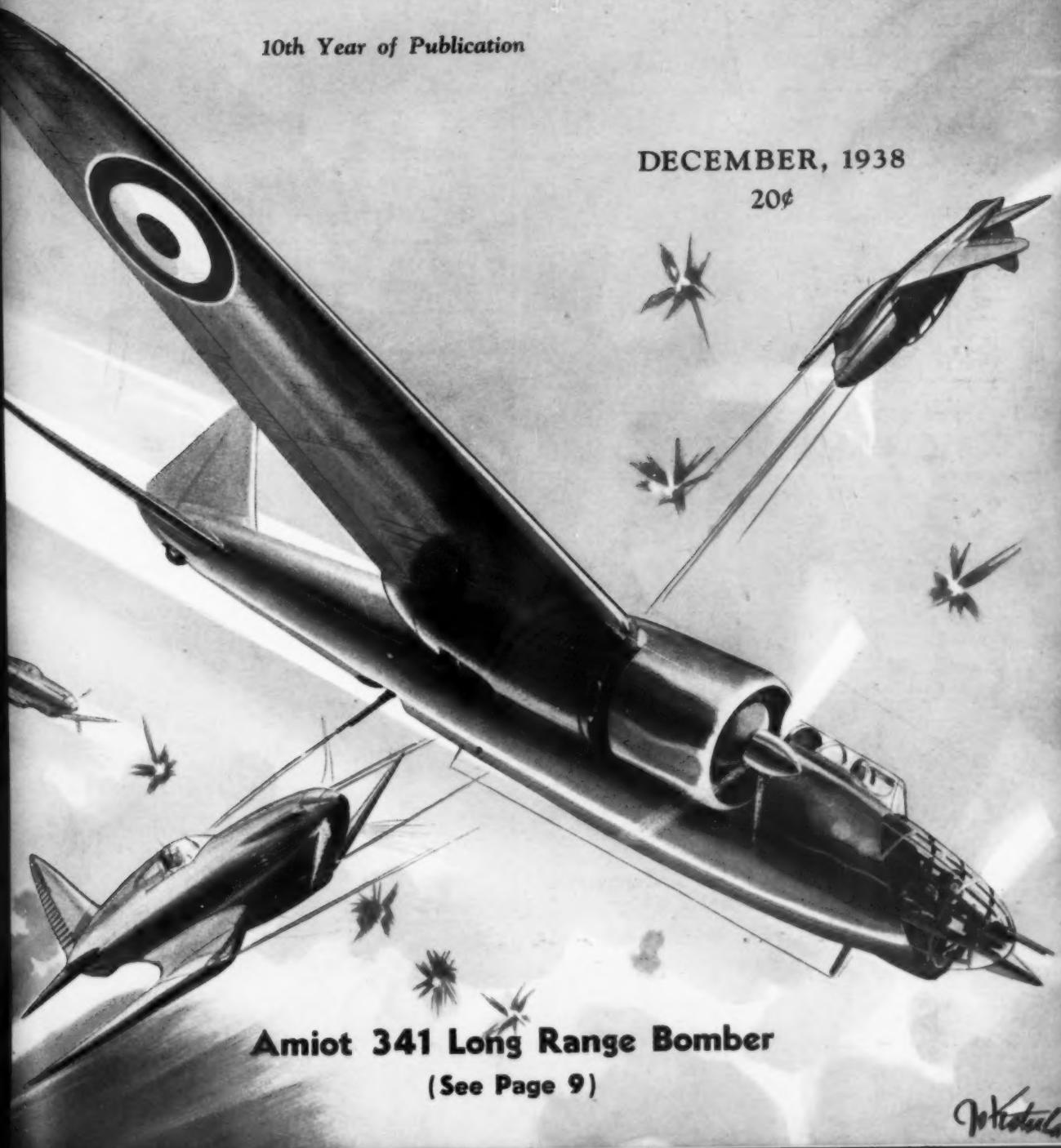


MODEL AIRPLANE NEWS

10th Year of Publication

DECEMBER, 1938

20¢



Amiot 341 Long Range Bomber
(See Page 9)

Watson

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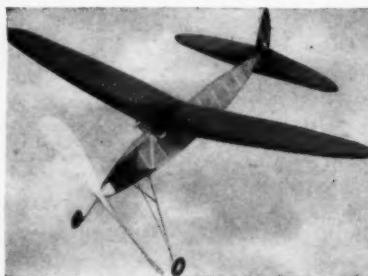
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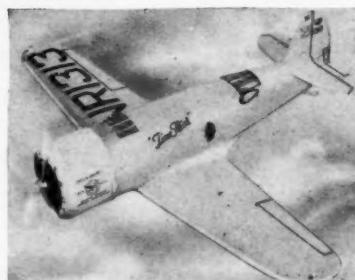
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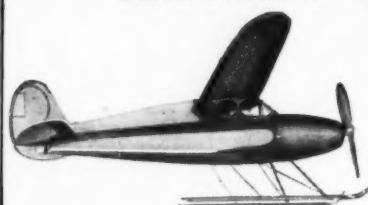
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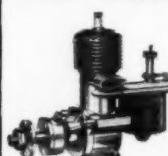
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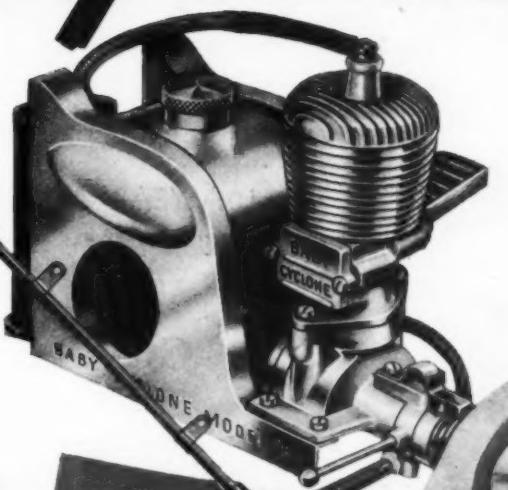
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Model AIRPLANE News

10th YEAR OF PUBLICATION

VOL. XIX

No. 6

Edited by Charles Hampson Grant

CONTENTS

DECEMBER, 1938

Aviation's Dare-Devil Scientists By Robert McLaren.....	6
The Flying Box Car Goes Around The World By Robert File.....	11
The Amiot 341 Long Range Bomber (The Plane on the Cover) Including 3 View By Robert McLaren.....	11
Build and Fly This Cloud Chaser By Bruno P. Marchi.....	12
Liquid Lightning By Richard Rioux.....	15
Frontiers of Aviation. Including: How to Build a Scale Model of Roscoe Turner's Thompson Trophy Winner By Robert C. Morrison.....	16
Designing Your Gas Model "Prop" By Charles Hampson Grant.....	19
Build The Piper Cub Minute Model By Herbert Weiss.....	20
"Gas Lines".....	22
Indoor Baby R.O.G. (Plans) By Richard Worel.....	26
The Physics of The Airplane (Article No. 5) By Lt. James Eames and Willis Nye.....	27
Air Ways—Here and There.....	28
Aircraft Insignia of The World By Elbert J. Weathers.....	30
A Gas Model Range Finder By Elbert J. Weathers.....	31
The Waco D-6 (Detail 3 View) By William Wylam.....	32
The Russian Fighter Z.K.B.-20 1-18 By Robert McLaren.....	33

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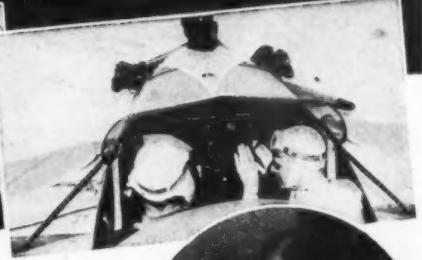
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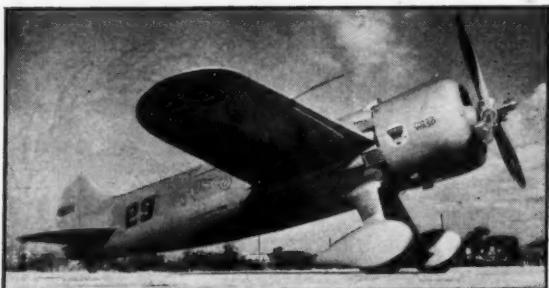
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Roscoe Turner's Laird Special with a Wasp 1050 hp. engine in which he won the Thompson Trophy. (Morrison)

YESTERDAY'S aviation scientists were bearded old men thrusting lean noses into musty note-books, gazing through watery

Aviation's Dare-Devil Scientists



The Schoenfeldt Firecracker of Keith Rider design won the Greve Trophy with Tony LeVier at the controls. (Yeager)



The Chambers R-1 Special with a Menasco B4 of 95 hp. in which Russel Chambers crashed. He died later. (Yeager)



The sleek Crosby CR-4, 300 hp. Menasco C6S4S powered Racer; flown by Harry Crosby. (Yeager)



The Funk Model B Sportplane powered with a Funk DNY-4, 60 hp. inline engine. (Kauer)



Art Chester's "Goon" which he piloted to 2nd place in the Greve Trophy Race. (Tracy from Yeager)

eyes at vibrating wind-tunnel models, and scribbling figures with gnarled, veined fingers. But to-day's progeny are lean-muscled, tensed jawed youths who hold tryst once each year in Cleveland and who call their convention the National Air Races.

A score of years ago, "Aerodynamicist" was a title few persons could pronounce and far fewer still claim. But science moves in a strange way to get what it wants.

To be sure, great discoveries have been made in costly, almost fanatically equipped laboratories. Men of awesome scholarly reputations have solved important problems which retarded scientific progress. But how many of the truly immortal discoveries have been made by obscure dreamers working poverty-stricken with woefully inadequate equipment? How many of the names in Science's Hall of Fame were once only despondent tenants owing half a year's back rent; whose bellies cried for the food the money that had gone into laboratory equipment could have bought them? Madame Curie, Gutenberg, Crookes, Welsbach, Finsen, Galton, Acheson; the list is endless. But they refused to let the torturing pangs of futility conquer them.

Courage, a firm knowledge of their subject, and a cold, scientific imagination pointed towards distant horizons of success. But each day brought the brilliant glare of the sun of world renown nearer.

Aviation has, from its inception, been the work of obscure men and women who dared defy convention and the tumultuous clamor of "Impossible!" to conquer man's bondage to earth. To-day this babe has

grown into startling strength and power. Production lines, contracts in units of a thousand or more, fabulous financing and incredible advancement marks her career today. And yet without exception the recognized leaders in today's aviation industry have a memory of ridicule, empty purses, nights of work without sleep and actual hunger.

One Pacific Coast company now has a back-log of one hundred million dollars in contracts; more than the value of the entire world's aviation industry a quarter of a century ago.

The United States has an aerodynamics laboratory with equipment unapproached by that of any other nation. Yearly this group of scientists force aviation ahead with a thorough firmness. Langley's ponderous wind tunnels, delicate measuring instruments and limitless resources make aeronautical progress a matter of simple units.

But aviation's penniless practical dreamers refuse to be denied. Their knowledge is a recollection of screaming slip streams, coughing motors and things going wrong at three hundred miles per hour. Every mistake screams in their ears: "Why? Why? Why?" A paper-thin wing vibrates itself into tattered bits of fabric and wood; why? A highly supercharged engine explodes in their faces; why? A rudder wags like a tackling mainsail and is suddenly useless as they coast into a one hundred-mile per hour landing; why?

And something within them cries out for an answer. Give up? Never! There was a reason for that spin which placed one of their number in a cast. And he was seeking that reason before the plaster had dried on his shattered body. Thought. Experiments. Tests. Then the answer and another of aviation's problems solved. In a multi-million dollar laboratory? Not on your life! In a battered old shed illuminated by iridescent globes.

Throughout Uncle Sam's three million square miles these youthful dreamers are working. For to-day's aviation scientists ARE youths; lean, bronzed, hard muscled, keen eyed youths whose one driving force is aviation advancement. One of their number finds remarkable success with a new type airfoil. Another designs an amazingly simple yet efficient retractable landing gear. Still a third finds a high-lift chamber which drags additional horsepower out of a protesting engine. And once a year they convene, each harboring with bursting pride a new aviation development, each anxious to see what his fellow dreamer has accomplished since last they met. Thus the 1938 National Air Races.

This convention of racing pilots the nation over in NOT a circus. It is NOT a gory spectacle of human greed for thrills. Men don't like to die. Men get no thrill out

Behind-the-Scene Glimpses of America's Foremost Racing Pilots and Their Fiery Steeds Who Through Their Dynamic Spirit Are Driving America to the Front Rank in Aviation

By ROBERT McLAREN

of hurtling through the air at 440 feet every second ready to scream from released horrifying tension should the sound of ripping, tearing wings blast into their tightly-strapped ears. There's no joy in praying fervently that the next moment, the next instant will not be your last.

But there is a thrill in knowing that that new skin-radiator is functioning perfectly; that that new aileron control you've spent months perfecting is controlling your roaring plane easily, efficiently. There is a thrill when you hear a monstrous transport thunder through the night above you: under perfect control with your new aileron design a few months later. You've licked a problem. You've given aviation, the science you love, something worthwhile.

And there's another emotion, a heterogeneous one, when you lance across the finish line going away from the pack and see a handful of the others, forced out of the race, craning their necks up at you. You've a lump in your throat because their new designs didn't function perfectly. But you've a real thrill, for yours did!

Personal animosity, grudge battles, hatred? Don't be foolish! America's racing pilots are the most tightly-knit organization in the world. When you've seen them together having a good meal a few hours before a race; laughing, joking, bantering; then you'll know friendly rivalry is all that is carried in their hearts.

But is dare-devil science strictly a man's game? Not on your life! Jacqueline Cochran, who is entirely feminine, an owner of a chain of beauty shops, came out on top of the heap in the 1938 Bendix Trophy Dash, a 2200-mile event from Los Angeles (Burbank), California, to Cleveland, Ohio, with additional prize money for a continued flight to Beldix, New Jersey. "She's just a girl with lots of flying time," some have said. But did you know she actually designed a new-type drift indicator which she used for the first time in her Northrop "Gamma" monoplane in the 1935 Bendix? She's made her scientific contribution along with the rest. And she's proud of it.

In the high cockpit of the sleek Seversky Executive military racer, which had set a new East-West Transcontinental record of 10 hours, 3 minutes, 7 seconds, just two days previous with Major Alexander P. de Seversky at the controls, she raced down the darkened runway at Burbank at 3 a.m. in the morning, dangerously heavily-loaded with a ton and a half of gasoline, a few seconds before Starter Larry Therkelso had poised a tiny flash above his head. The runway was in total darkness due to the danger of windshield reflections. The slim, heavily helmeted head of Miss Cochran eyed him narrowly. Then the bobbing flash arched down and the giant P & W Twin Wasp Senior engine barked

power, twelve hundred horsepower of it, and the ship moved forward.

Painfully slow at first, Flames vomited from twin exhaust stacks and the sleek racer careened down the runway. And a crowd of fifty thousand persons, almost an air meet in itself, caught its breath as the orange-violet exhaust glow hugged the ground far away in the night. Still on the ground and fifty-foot high tension wires to be cleared! But as though she had deliberately flaunted the crowd's tenseness, she eased the stick back hurriedly and the twin blobs of cherry-red flame vaulted lightly into the sky.

A mile high in the night she donned a strange rubber nose and mouthpiece, a Mayo Oxygen Mask, the latest scientific development for sub-stratosphere flying. A girl test pilot heading for dangerously high altitudes with only a thin yellow sheet of rubber between her and unconsciousness. Flying a badly overloaded ship five miles in the air with a radical new type oxygen mask for thrills? Ask Jackie and she'll tell you: "I want to do something for aviation. Prove new things. Help advance a new science. It's in my blood and I want someday to point out a new gadget and say: 'I helped perfect that!'"

Frank Fuller, Jr., scion of a San Francisco paint fortune and veteran speed pilot, flew his identical Seversky model into Cleveland half an hour behind the plucky girl. Paul Mantz, movie stunt man, in a Lockheed "Orion" monoplane; Max Constant, flying Miss Cochran's Beechcraft D-17S; and Ross Hadley, Hollywood explorer in a similar ship, placed in that order.



The Marcoux Bromberg Racer with a 700 hp. Wasp Jr. which placed 2nd in the Thompson Trophy Race. (Winkler)

Robert Perlick mounted huge gas tanks in his Wright "Cyclone" powered Beechcraft A-17FS, strapped the Mayo Mask to his face



Jacqueline Cochran's Seversky Racer AP-7 powered with a 1025 hp. engine that won the Bendix Trophy Race. (Kauer)



George Dory was severely injured in this Bushey B7M-1 Menasco-powered Special of 160 hp. (Yeager)



The Curtiss Conqueror powered 825 hp. Pearson-Williams Racer with fixed landing gear piloted by Lee Williams.



Steve Wittman's famous Flying Box-Car in which he placed 3rd in the Thompson Trophy Race. (Yeager)



Art Chester's "Goon" with cowling removed showing the inside "works": Menasco C6S-4, 290 hp. (Yeager)



The Delgado Flash with new pants and cowling, built by members of the Delgado Trade School. (Tracy from Yeager)



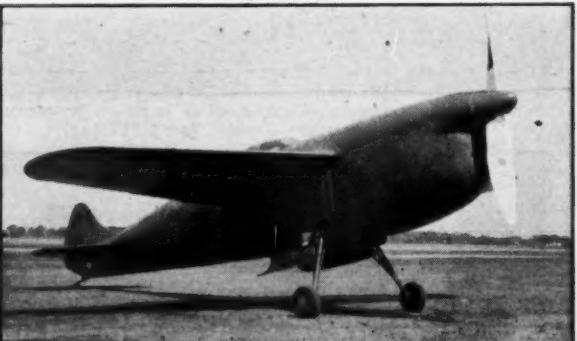
The races would not be complete without a Keith Rider entry. The Keith Rider Eight Ball with a 290 hp. Menasco C6S-4, piloted by Joe Jacobson and Roger Don Rae. (Yeager)



The Military Aircraft Corp H. M. 1 pursuit ship. It is Hawks' rebuilt "Time Flies" with a twin Wasp 1000 hp. engine. (Winkler)



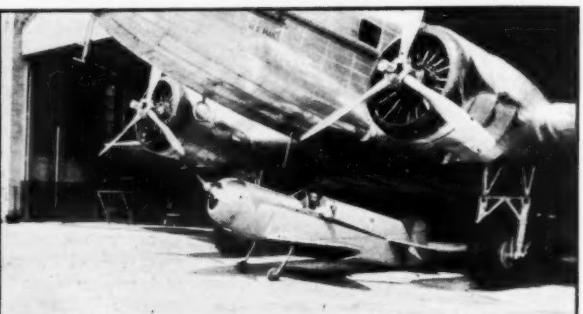
The slowest plane at the races; Emil Kropf's Fiesler FI-156 "Storch," powered with an Argus AS-10C, 240 hp. motor. It practically can stand still in the air. Its high speed: 120 m.p.h. (Yeager)



Folkerts Super-Special; a typical example of a super-streamline racer with retractable landing gear. (Kauer)



The Marcoux Jackrabbit powered with a Menasco C6S-4 of 280 hp. Note the fixed landing gear. (Winkler)



The largest and smallest planes at the races get acquainted. The Douglas overshadows the midget Popjoy Special which later cracked up on the take off. (Tracy)



The Wedell Williams "92," revamped for the races, powered with a P & W 550 hp. Fixed landing gears are returning it seems. (Winkler)



Harold Johnson's clipped-wing stunt plane which provided many thrills. It has a wing span of only 20 ft. (Tracy)



What was left of Chambers' plane after the crash. His mechanic, Ernie Smith, stands beside the wing. (Tracy)



The Meyers OT-W metal biplane powered with a Warner 125 hp. engine. It did some fine flying. (Kauer)

and nosed into the sub-stratosphere to take advantage of the upper-air winds. But motor trouble brought him down at Woodriver, Illinois, his dream smashed a second time. A year ago his heavily loaded ship was sprinting down the Burbank runway when it began to sway sickeningly. The painted landing gear gave way and the ship skidded along on its belly with five hundred gallons of volatile gasoline sloshing menacingly behind the pilot's head. This year a strengthened landing gear got him into the air safely but motor trouble let him down. One problem solved; another to be answered!

Frank Cordova tried this year to prove the adaptability of trimotor construction to racing plane design with his Bellanca 28-92 Racer. And for six hundred miles he averaged almost 350 miles per hour! But his nose engine coughed to a resigning halt and he continued another thousand miles on two motors. Safety and reliability with speed are his contributions to aviation. And he'll be back next year with the answer to that balky center motor.

Long-range flying still has its problems but America's dare-devil scientists are solving some of them every year.

Tony LeVier, bespeckled Angeleno, emerged as King of the Closed Course Racers this year with a startling 250.886 miles per hour average over the two hundred mile grind of the Greve Trophy Race. Why did he win? What scientific problems did he solve that baffled the other five planes in the race? His ship, the Schoenfeldt-Rider "Firecracker" is a fairly conventional low-wing monoplane of steel-tubing construction, fabric covered with a tiny retractable landing gear. But Tony LeVier spent months of constant mathematical research on his ship. He designed and tested five propellers before he found the most efficient model.



The new Aeronca K. L. powered with a new Lycoming 50 hp. engine. (Kauer)



Pat Sweeney, Dick Granere's mechanic, starting one of four Foster motors mounted on Granere's plane, to help'er along. (Tracy)

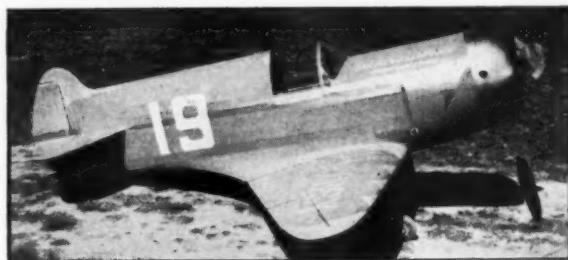
He has designed TWO oil coolers, one of the skin-friction type, the other a conventional cartridge cylinder. But that was not enough! He set to work on the Menasco C6S4 supercharged engine and wrought several radical changes on the stock model. What he did no one but himself and a

the results of another year's aeronautical progress for him. This time he brought a completely new ship, "The Goon," to Cleveland. Art watched, with a sinking heart, as Captain Michael Detroyt roared by him in the 1936 Air Races in Los Angeles. And he watched especially the performance of the new Ratier two-pitch propeller, a design in which the pitch changes from low into high automatically at a speed of one hundred miles per hour. He resolved to have one and it has taken him nearly a year to cut all the red tape spun out by the French Government to obtain it. It arrived, but more complications had to be ironed out; more problems to be solved! The propeller rotated clockwise instead of counter-clockwise as ALL American motors do. Disheartened? No sir! Art set to work on his big Menasco C6S4 and changed the direction of rotation! That, fellows, is real aviation achievement. Further new ideas was the use of a symmetrical airfoil and changes in incidence at two points: 20 inches out from the fuselage and at the wing-tips.

All of which might have won for him had he not cut a pylon when vaporizing oil exhaust opaqued his windshield. With set jaw he hauled around in a sharp vertical, rounded that pylon, and fought back into the lead! But at the three-quarter mark his ship belched more oil and his vision ahead was neatly blanketed. Under such a handicap he dared not close in on the pylons and he swung wide around the last one. Tony LeVier, coming like a beserk meteor, alert for every opportunity, made his bid. Like a yellow streak he lanced in through the hole and sped home the winner.

Joe Jacobson of Kansas City flew one of the most beautifully designed ships at the Races, the Keith Rider "Eight Ball," into third place. This ship, tested by Roger

(Continued on page 48)



The Light Airplane Developers F-15. The smallest plane at the races, flown by Walter McClain. (Popjoy 90 hp.) (Yeager)



The Beechcraft D-17S with a Wasp Jr. SB of 400 hp. (Kauer)

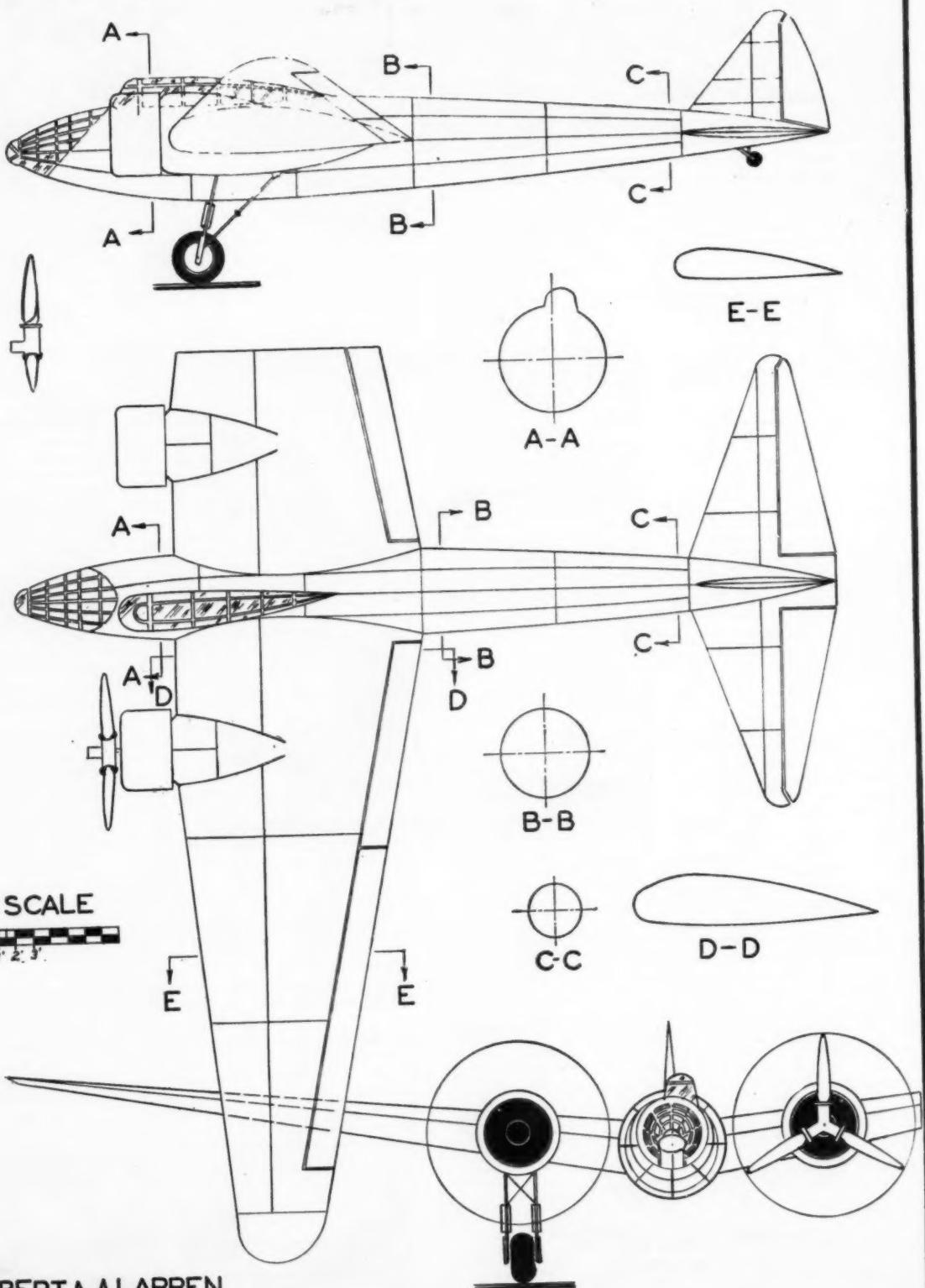
handful of trusted workmen know. But perhaps those changes will become apparent sometime this year in Menasco's future models, or even in the designs of other manufacturers. He's done something for aviation and he proved it would work when he won the battle for the coveted trophy.

A nose behind him was Art Chester, no stranger to any follower of air racing and a real dare-devil scientist. The things he's done in airplane and motor design are now accepted practice and this year he was back with even more startling innovations:



Earl Ortman and Dave Elmendorf beside the Marcoux Bromberg Jackrabbit and the Twin Row Special (Yeager)

AMIOT LONG-RANGE BOMBER





Mr. Leo Rutledge, I.G.M.A.A. Director of Kansas, explains the design and construction details of the 8 ft. KG which he built, to his class in model building

"FLYING BOX CARS" are what they call them; those big slow flying Gas Jobs commonly known as the KG—the "Grand-dad" of present day gas models. Since the advent of the smaller type, highly streamlined jobs the KG's have been nicknamed the "Flying Box Cars" due to their large size and enormous wing area. The name KG stands for the designer and builder of the original model. The model was designed in detail by Charles H. Grant and the original ship was built by Joseph Kovel. This was back in 1933 when gas model interest was just beginning to show itself. After two years of experimenting on the design the complete plans were published in MODEL AIRPLANE NEWS in April and May, 1935. The model was designed and stressed for engines of 1/3 to 1/2 horsepower, which explains its large size and sturdy construction. Back in those days the small, efficient, present-day engines were mostly in the experimental stages. The model was designed primarily for aerodynamic stability to prevent crashes and streamlining was

only a minor matter. In spite of its large size it has shown remarkable stability under all flight conditions and it is probably one of the most inherently stable ships ever built.

The KG-2 although having a wing span of ten feet, actually has a wing loading just as light as the average ship of six to seven foot span; due to its enormous wing area. The KG-2 has a wing area of approximately thirteen square feet which is just about half the wing area of the world's smallest man-carrying airplane.

The KG was the first to bring out the



The ten foot wing span KG, former holder of the world's record for duration. Time: 64 minutes, 40 seconds (with 1/8 oz. of fuel per pound)

The Flying Box Car Goes Around The World

Story of a Great Ship

By ROBERT FILE

removable motor mount, which was a big step forward in model plane design since it allows a close examination of the entire engine and electrical system without tearing out the nose of the ship to look for engine trouble or to test or renew batteries. The motor mount is of very simple construction and will repay the builder in many ways to have access to the entire engine unit. This also allows the removal of the engine unit to a vise where trouble due to vibration in the ship can be more easily traced. Also, the removable mount is invaluable for saving time at contests—where the engine always act up.

Another very important point in favor of the removable motor mount is in the case of the builder having several ships and only one engine; regardless of the type of ship the mount can be made to slip in any of them. An engine mounted securely in one model practically eliminates its use in other ships without several hours of work "in changing over"; while the removable mount can be used in any

(Continued on page 44)

The Amiot 341 Long Range Bomber

The Plane on the Cover

THE world is looking on aghast as Hitler threatens the dismemberment of Czechoslovakia, Europe's youngest nation peopled by Europe's oldest race: the Slovaks. Nations are watching with a nervous tenseness unequalled since the holocaustic days of 1914. And La Belle France, land of charm, smiles and beauty, is keeping her armaments to the highest note since the Armistice.

And it is strange that the Frenchman's appreciation of beauty should play a part in this rearmament program. But the part it plays is a major one and here's why.

France's aeronautical engineers are characterized by two outstanding traits: an intense interest in aerodynamic research, and an appreciation of beauty. And these two characteristics have combined in maximum quantities which has resulted in her latest and most potent fighting craft: the Amiot 341 Long Range Bomber, shown on our

cover this month.

A twin-engined, long-range, high-performance monoplane of startling performance and symmetry of outline, this aerial dragon is playing a major part in France's aerial armament rejuvenation and on her shark-like wings rests the brunt of France's defense.

Construction is of radically new methods but of proven adequacy. Each wing section is built up in three longitudinal sections; a leading edge, a main spar section and a trailing edge portion. The high-strength steel spar has duralumin sections of progressive thickness and a sheet web reinforced with vertical stiffeners. The leading and trailing edges are built up of open-section profiles. This powerful structure is covered with a stressed skin of sheet aluminum reinforced with longitudinal stringers. This skin is flush jointed and flush riveted.

By ROBERT McLAREN

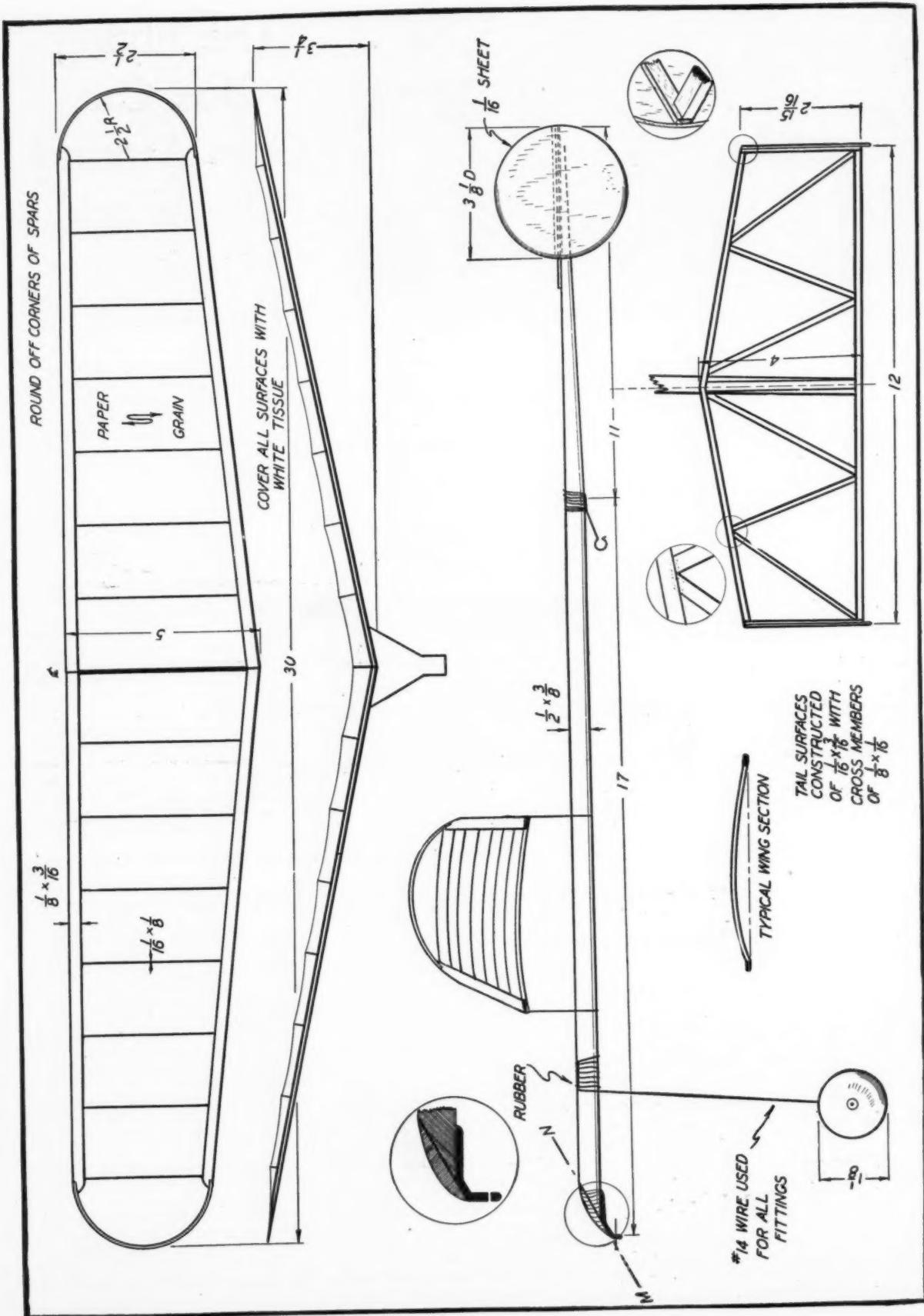
The ailerons and flaps are hinged to an auxiliary spar near the trailing edge. The latter are of the split trailing edge variety of all-metal construction.

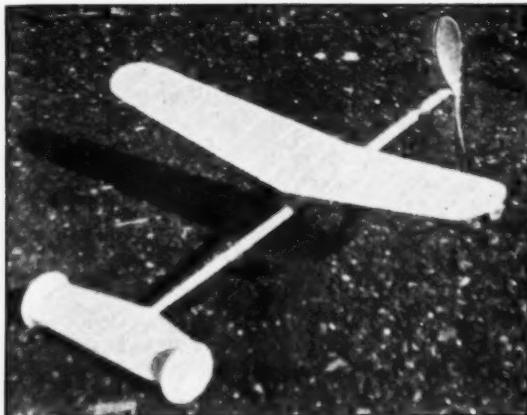
The fuselage is of uniform circular cross-section of monocoque all-metal construction. The structure is built up of a number of primary and secondary frames of open-section steel, longitudinal stringers, and a stressed skin covering. The majority of the load is carried on four main longerons on the central portion of the structure.

The tail units are of complete cantilever construction and of all-metal components. The control surfaces are fabric covered.

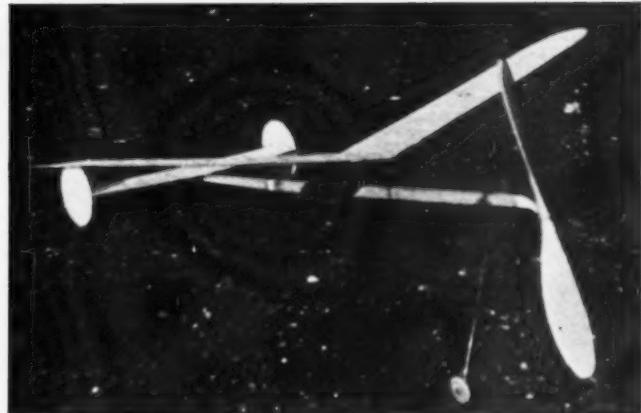
Ingenious design features the construction of the retractable landing gear; a patented design known as the "Electric Knee." This novel gear was designed by the Societe de Air-Equipment (Establissements Viet).

(Continued on page 46)





Twin fins and large stabilizer gives stability



Note its simple but high performance lines

Build and Fly This Cloud Chaser

GOOD NEWS FOR GROUP LEADERS: Here is a rubber-powered high performance model that can be built by your novice club members. Start the younger enthusiast off right—recommend this model and this MODEL AIRPLANE NEWS series to the less experienced flyers. A little encouragement and aid will go a long way towards producing a 1940 national record holder in your group.

QUIET now! Tiptoe in and we'll show you the newest cloud chaser at rest. There you are—isn't it a beauty?

With a faster climb than a rising stock market and a sweeter glide than a sea gull, this stick model, especially designed for novice builders, is certain to find favor with junior aeronauts everywhere.

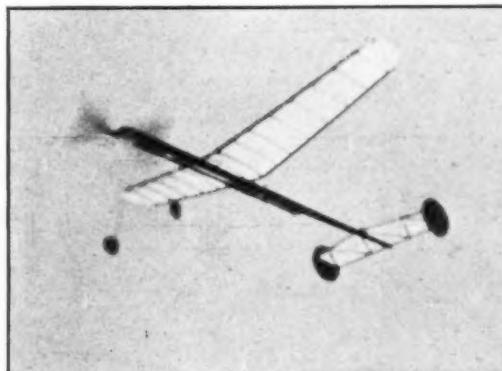
Did you build that beginner's outdoor hand-launched glider MODEL AIRPLANE NEWS presented in its June issue? Then you're all set to continue with this cloud chasing craft which carries on where the glider left off and introduces a host of new building kinks.

Interesting features of this stick ship are its easy-to-make twin rudders and choice of rise-off-ground or hand-launched flights. No "parlor gnat" is this . . . no, sir; it's a big, sturdy flyer thirty inches in wing span. Even if you've never tackled a plane of such proportions, don't hesitate a moment—for besides being a sweet soarer, this stick flyer is simple to build and provides splendid training for the heavier contest entries you'll be building soon.

Before starting construction, let's have a brief sermon on building models, especially outdoor craft:

With proper design, proper construction and proper adjustment, even the most inexpensive model will turn in good flights consistently. But a builder must utilize all three points in his work; so let's resolve to always choose a design with plenty of "flyability," build according to specifications and make all the proper adjustments before ever fully

By BRUNO P. MARCHI



The little ship in full flight: Going up!

winding a model.

You built the beginner's outdoor glider? Fine, then you're off to a good start. Here's lesson No. 2, but it's not a tough assignment—plenty of fun ahead for

those who . . .

Select a medium-hard piece of $3/8 \times 1/2 \times 28$ -inch balsa for the motor stick. Measure in eleven inches from an end on one of the $1/2$ -inch sides and from that point taper the stick to $1/4$ -inch at the rear so tail end of stick measures $3/8 \times 1/4$ inches. With thinned glue, precoat front of stick where large thrust bearing will be glued on. Repeat procedure allowing cement to dry well between coats, filling the pores of the wood to provide a firm gluing base. Then using thicker glue, cement thrust bearing to stick.

While bearing cement is drying, bend the rear hook and propeller shaft from No. 14 wire. For this work a good pair of pliers are most necessary.

The few extra pennies invested in pliers of good quality will repay with longer and less troubled service. Contest losses and crumpled fuselages caused by missshapen fittings frequently can be traced to poorly-bent fittings made with inferior pliers.

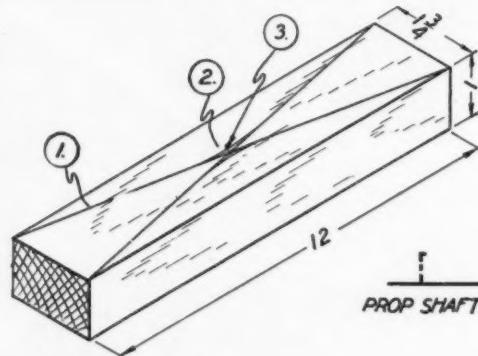
With fittings made, glue rear hook to motor stick, first pre-coating as with the thrust bearing. Then apply another coating of cement, bind with thread and—you've guessed it!—apply a final coating of cement.

After bearing is dry, bevel nose of motor stick as indicated by line M-N on plans. Precoat, then add extra nose piece shown, shaping with sandpaper and cementing liberally. Bind entire nose portion with thread and add several coatings of glue.

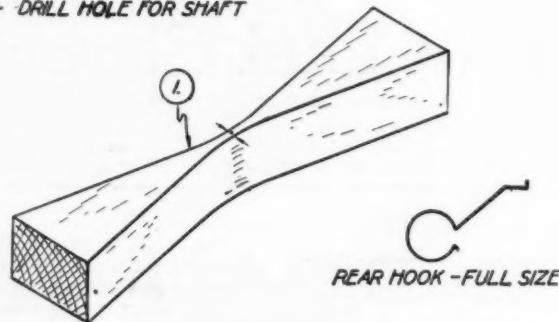
Make full-size drawings of
(Continued on page 54)



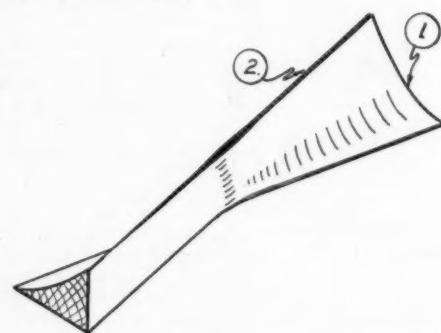
Off she jumps: Launched by the author



1. DRAW DIAGONALS
2. LEAVE EXTRA AREA FOR HUB
3. DRILL HOLE FOR SHAFT

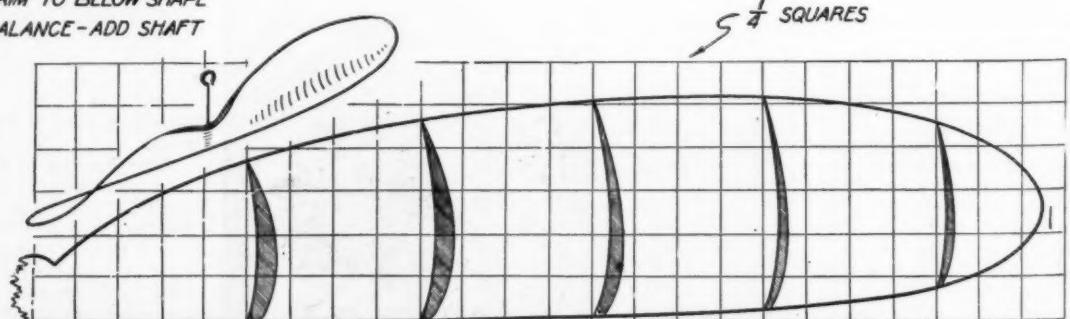


1. CUT BLOCK TO ABOVE SHAPE
SANDPAPER TO OUTLINE



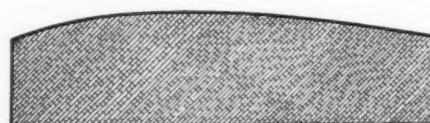
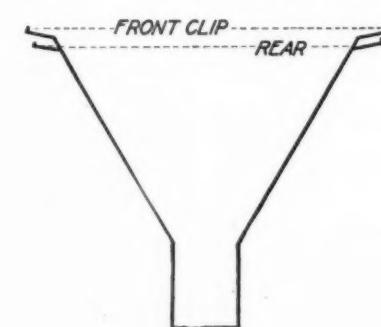
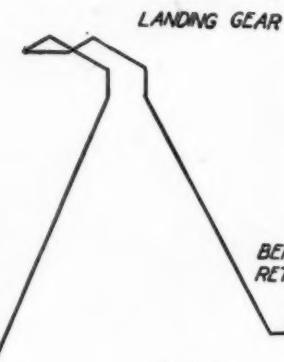
1. SAND IN CONCAVE AFTER CARVING TO SIZE
2. LEAVE SURPLUS

CARVE CONVEX SIDE TO GOOD AIRFOIL
TRIM TO BELOW SHAPE
BALANCE - ADD SHAFT



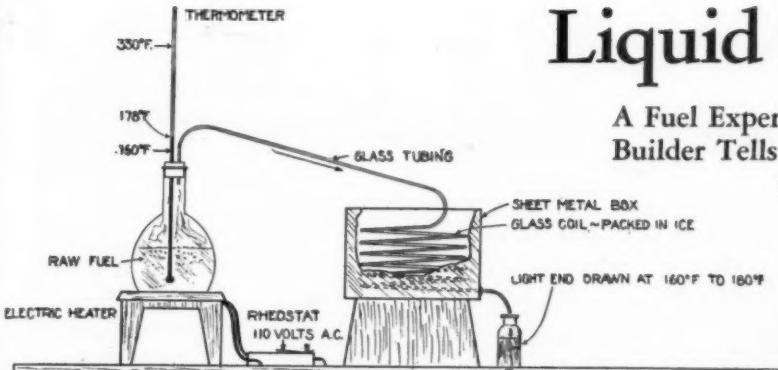
FULL SIZE PROP TEMPLATE

WF TYLER



TEMPLATE FOR MAKING RIBS
CUT FROM THIN ALUMINUM SHEET

$5 \frac{1}{4}$ SQUARES



ADVANCE TEMPERATURE IN 5°F STAGES EVERY 3 MINUTES THROUGH THE RANGE FROM 160°F. TO 360°F. CHANGE SAMPLE BOTTLES EVERY 20°. SEAL AND LABEL IMMEDIATELY.

PROBABLY every model aircraft engine has some time in its life been seeped in an obnoxious concoction, created by a zealous owner with the general hope of developing a new type of fuel, performance or both. Personally, having seen everything from "mountain dew" to embalming fluid dripping from the exhaust ports of countless engines, I feel that this discussion should be limited to the most common and yet the most powerful fuel: gasoline and its various blends.

Various grades of gasoline are produced by several methods of fractional distillation of petroleum. Straight run gasoline has a higher B.T.U. content than cracked fuel and should be used as a base if available. Casing head gasoline is produced by compressing natural gas in the presence of heavy oil, then cooling and distilling. This yields a very good component for blended fuels for controlling the vaporization range. The diagram shows a simple still with which you may draw off various ends at different temperatures. Place them in bottles, then try each one and blends of the best ones to find a mixture that suits your engine best. The diagram shows still with ice or water cooled coil. An accurate thermometer should be used and the heating unit should be controllable to within several degrees.

The first signs of condensation will appear around 170° F. Watch the temperature carefully. Forty per cent of the fuel should boil off under 220° F. (boiling point of water); 75% should be off when 320° F. is reached; 90% under 345° F. and the remainder under 375° F. Nearly all the fuel should be recovered but allow about two per cent for residue. A good general fuel for model work can be mixed from these samples—20% that came off around 200° F.; 65% from the 250° F. range and 15% at 340° F. So you see you can produce nearly any type of fuel you desire.

Now if the combustion of the mixture is too rapid the engine will knock, showing inefficiency besides being injurious to the engine structure. Here the octane rating comes to our assistance. Iso-octane is a clear, colorless liquid that is considered the perfect fuel. However, though a petroleum product, it costs nearly \$25 a

Liquid Lightning

A Fuel Expert Who Is an Experienced Model Builder Tells You How to Produce Or Select the Most Efficient Fuel for Your Gas Motor

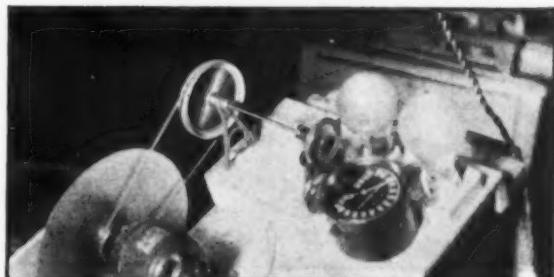
By RICHARD RIOUX



A motor in the act of tearing off a duration test run

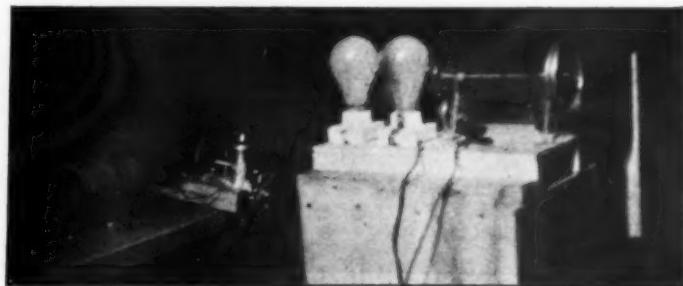


Samples of motor fuel ready for testing



An R.P.M. testing unit showing the scanning disc and other equipment

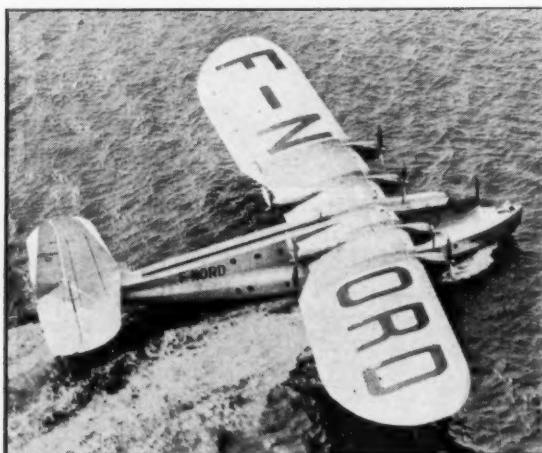
The complete testing outfit: Scanning disc, speed regulator and motor unit in the author's laboratory.





The new 208 m.p.h. German seaplane with retractable wing floats, for non-stop North Atlantic service. (Monkmeyer)

By ROBERT C. MORRISON



The French Trans-Atlantic seaplane that just crossed the Atlantic from Europe though it is five years old. (Arnold)

Frontiers of Aviation

HERE is an announcement made by the Lockheed Aircraft Corporation which speaks for itself . . . "Its cloak of secrecy cast aside for the first time, the new Vega airplane has been announced in a report made public by the Vega Airplane Co., subsidiary of the Lockheed Aircraft Corp.

"President Mac Short, head of the organization, released first details of the new product. The plane will incorporate the Unitwin engine installation, a new type airplane pow-

er-plant which has been under development for more than three years. Known as the Vega, the plane will be a low-wing monoplane carrying five or six persons, and will generally qualify for the requirements of current airline-type transports. It will be metal structured and have the dual engine power-plant mounted in the nose of the fuselage and geared to a single constant speed propeller.

"Wing span of the new plane will be 41 feet. Overall length will be 31 feet, 5½ inches, and the plane will be 9 feet, 1 inch in height. Estimated gross weight is 5411 pounds. Retractable tricycle landing gear will be a feature of the plane, Short said.

"The Vega airplane will follow the general trend of the Lockheed transports produced by the parent Company, and will utilize trailing edge wing flaps, twin rudder and fin tail arrangement and other advanced aerodynamic features.

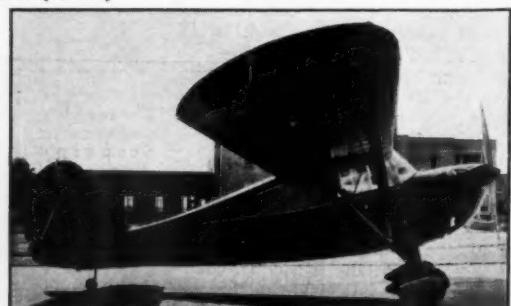
"The Unitwin power-plant consists of two Menasco engines of 260 horsepower each, mounted side-by-side and driving a single constant speed propeller through a new method of gearing. The gear arrangement embodies over-running clutches which operate on the same plan as the over-drive installations in modern automobiles. Through this arrangement close synchronization of the two engines is unnecessary, as they continue to run on the same speed even though the power output of one may be exceeding the other. Likewise, if one engine should stop, the other does not have to work against the inertia of the dead engine. Another feature pointed out by the officials of the company is the fact that by placing both engines in



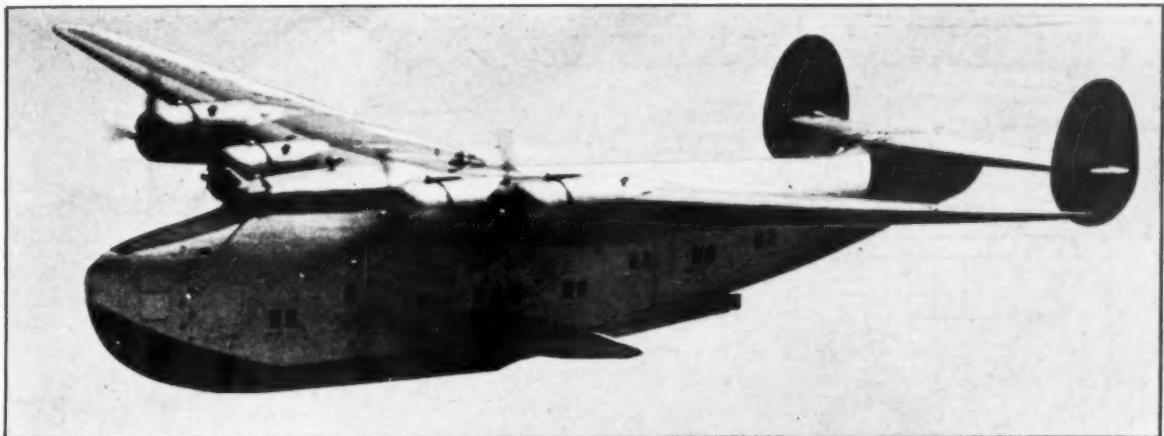
The Miller H.M.-1, (old "Time Flies") rebuilt for the army competition trials. (Kuster)



Larry Brown's new sportplane. Note the slots and flaps.



The new Aeronca Chief with a Continental engine.



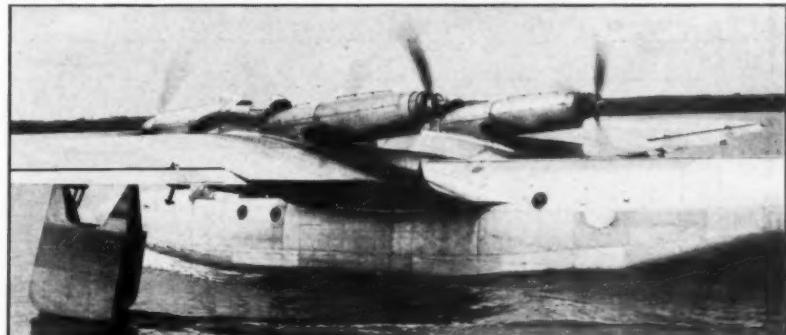
The new Boeing Clipper making a new American record with 77,500 pounds gross load (Acme)

Highlights of the Latest Developments in Aviation—How to Build a Scale Model of Col. Roscoe Turner's Thompson Trophy Winner

one center compartment, excessive drag from the wing nacelles is almost entirely eliminated.

"The body structure of the plane will consist of two main sections. The forward section will be constructed of steel tube truss upon which is mounted the cabin shell fabricated from aluminum alloy. The rear section of the body will be a semi-monocoupe structure of aluminum alloy and will be attached to the steel tube structure aft of the cabin. The power-plant will be supported by a welded steel tube engine mount, removable from the forward structure of the cabin.

"The wing will be of metal and there will be two main panels bolted directly to the fuselage truss. With this arrangement there will be no center section in the airplane. Wing flaps of metal structure and fabric covered will be provided in each wing panel, and in addition, there will be a center section flap of split type metal construction. Ailerons will be fabric covered, with static and dynamic balances. The tail group will consist of an



Rear view of the new German Trans-Atlantic seaplane showing the retractable wing floats and rear motors that may be raised 10° to avoid spray. (Monkmeyer)

all-metal stabilizer, fabric covered elevator with a trimming tab for maintaining longitudinal balance and twin vertical metal tail surfaces mounted at the tips of the stabilizer.

"The two main landing gear wheels will retract into the wing and the nose wheel will be retracted into the engine compartment. Even when retracted all three wheels still provide for emergency landings.

"The cabin is designated after the manner of the modern automobile, two different cabin styles being produced. The cus-



The armed Junkers Fighter-Bomber Gu.87. This plane has been used in Spain. (Monkmeyer)

tom or private owner version will provide commodious comfort for five persons; while the feeder airline version provides accommodations for pilot and five passengers. The cabin will be sound-proofed, heated and ventilated.

"The main baggage compartment will be located below the rear seats, and may be loaded through an exterior door in the side of the cabin. Mail may be carried in the wing adjacent to the cabin.

"Although no performance data is ready for release, President Short indicated the plane will have a top speed in excess of 200 miles per hour and will have a non-stop cruising range of about 1,000 miles. Production of the plane is underway at the Vega plant at the present time. The first plane is expected to be completed about the middle of January." And that is the full announcement.

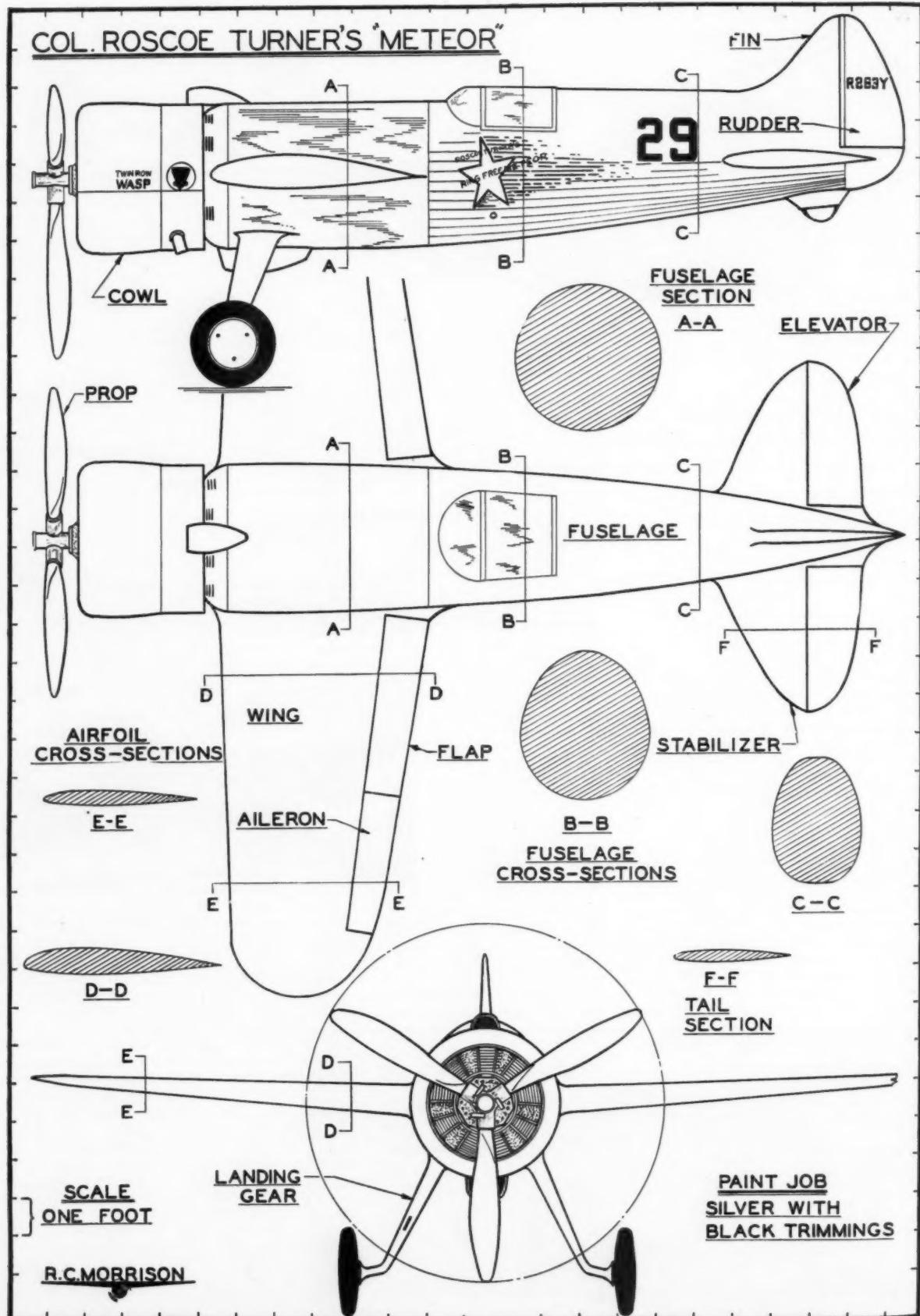
Nothing is mentioned of Fowler flaps

(Continued on page 35)



A Jugoslavian Army plane: a converted German transport. (Globe)

COL. ROSCOE TURNER'S "METEOR"



Designing Your Gas Model "Prop"

Article No. 80

SO FAR in the discussion of gas model propeller design the calculation of the characteristics of propellers has been based on the assumption that the motor and propeller turn at 4000 revolutions per minute, (R.P.M.). This is the most efficient running speed of most motors. However, some motors develop their maximum power at other speeds. In such cases the values of the propeller characteristics obtained by means of the graphs, tables and formulas given in previous articles, would be inaccurate. This is due to the fact that as the speed varies the change of power output does not vary in the same relationship with the change in power required to drive the propeller.

The power of the engine varies directly with its R.P.M.s up to a certain limit of speed; while the power required to drive the propeller varies as the cube of the R.P.M.s of the propeller. Also, a propeller of a given pitch turning at 4000 R.P.M. would have an entirely different pitch speed if it turned at some other rate.

As the pitch speed of any propeller must be a definite proportion of the level flight speed of the plane upon which it is mounted, this fact is important. The pitch speed of a propeller is the pitch (theoretical) times the revolutions per minute. This should be approximately 50% greater than the plane's level flight speed. In other words, the propeller slip should be about 33-1/3%. If a propeller of eight inches of pitch is mounted on a plane, and it turns at 4000 R.P.M., the pitch speed is 2666.7 feet per minute. If an engine that turns 5000 R.P.M. is installed in this ship, the propeller pitch would have to be only 6.4 inches in order to develop the same pitch speed.

The correct pitch of the propeller which turns at a speed other than 4000 R.P.M., may be determined accurately and conveniently by using the graph on page No. 17 of the November issue, as a basis for calculation. This gives the plane speed and the corresponding pitch to use when the propeller turns at 4000 R.P.M. Then the correct pitch may be calculated by inserting the pitch value taken from the graph in the following formula:

$$P = P_a \left(\frac{4000}{V_p} \right)$$

P = the correct pitch of the propeller for any specified number of revolutions per minute; P_a = the pitch given on the graph for any plane level flight speed;

How to Determine the Pitch, Diameter and Blade Width for Various Engine and Propeller Speeds

By CHARLES HAMPSON GRANT

DIAMETER=TEN TIMES BLADE WIDTH

PITCH		8 in.		9 in.		10 in.		12 in.	
H.P.	Cu	D	WB	D	WB	D	WB	D	WB
1/6	0.6	16.1	1.61	15	1.5	14.2	1.42	13.5	1.35
1/6	0.5	15.4	1.54	14.3	1.43	13.5	1.35	12.9	1.29
1/7	0.42	14.8	1.48	13.7	1.37	12.9	1.29	12.3	1.23
1/8	0.37	14.3	1.43	13.3	1.33	12.5	1.25	12.0	1.20
1/10	0.30	13.5	1.35	12.8	1.28	11.9	1.19	11.5	1.15
1/15	0.20	12.3	1.23	11.4	1.14	10.7	1.07	10.2	1.02
1/20	0.15	11.6	1.16	10.6	1.06	9.8	0.98	9.5	0.95

Table of (D) and (WB) Values to use with various Pitches and Engine Powers at 4000 R.P.M.

V_p = the number of revolutions per minute at which the propeller will be driven by the engine.

For example, if your plane flies 25 miles per hour in level flight and the normal running speed of the engine is 5000 R.P.M., the correct pitch is found as follows: On the graph a pitch of ten inches is specified for a 25 m.p.h. plane speed. Now inserting the values in the formula, we have:

$$P = 10 \left(\frac{4000}{5000} \right) = 8 \text{ inches pitch.}$$

However this is only part of the story: The required diameter and blade width of the propeller used on the 5000 R.P.M. motor, as well as the pitch, must have different values than the propeller that is used on a motor turning 4000 R.P.M. The question is: How may the correct values of these quantities be determined? As in the case of the pitch of the propeller for the 5000 R.P.M. engine, the diameter may be determined by finding the correct diameter value for a propeller that is to turn at 4000 R.P.M. The correct diameter for any other normal motor speed then may be found by inserting this value in a conversion formula. Let us follow through a practical example to illustrate the procedure.

It was stated previously that the plane flies in level flight 25 m.p.h. A propeller pitch of ten inches is required for such a ship according to the Required Pitch Graph. The next step is to determine what the correct diameter should be for such a propeller; the blade width having a value of one-tenth (1/10) the diameter. The table for correct diameters and blade widths on page 19 will give you this information.

In the fourth double column from the left values for these quantities are shown for various engine powers, under ten

Chapter No. 5

inches of pitch. The diameter specified for 1/5 horsepower is (14.2 inches and the blade width is 1.42 inches). Thus on a 1/5 horsepower engine turning 4000 R.P.M., a propeller should be used having a pitch of ten inches, a diameter of 14.2 inches and a maximum blade width of 1.42 inches when the plane which it powers flies 25 miles per hour in level flight.

If, for any reason you prefer to determine the required diameter and blade width by some other method, you may use the formula appearing at the bottom of column three, page 44, November issue. Simply

insert the value for HP., pitch P, and blade width W_B , and solve for (D), the propeller diameter. The formula is as follows:

$$H.P. = (0.000005) P W_B D^3$$

Inserting the known values, we have:

$$0.2 = (0.000005) 10 \left(\frac{D}{10} \right) D^3$$

$$\text{Then } D^4 = \frac{0.2}{0.000005} = 40,000,$$

$$\text{or } D = \sqrt[4]{40,000} = 14.15 \text{ inches}$$

Thus by means of the formula, the correct diameter has been determined as 14.15 inches. These values are approximately the same as those given in the table.

Now by means of a conversion formula, in which these values are inserted, the correct value may be found for the diameter of a propeller to be mounted on a 1/5 horsepower engine, the normal running speed of which is 5000 R.P.M. The formula is as follows:

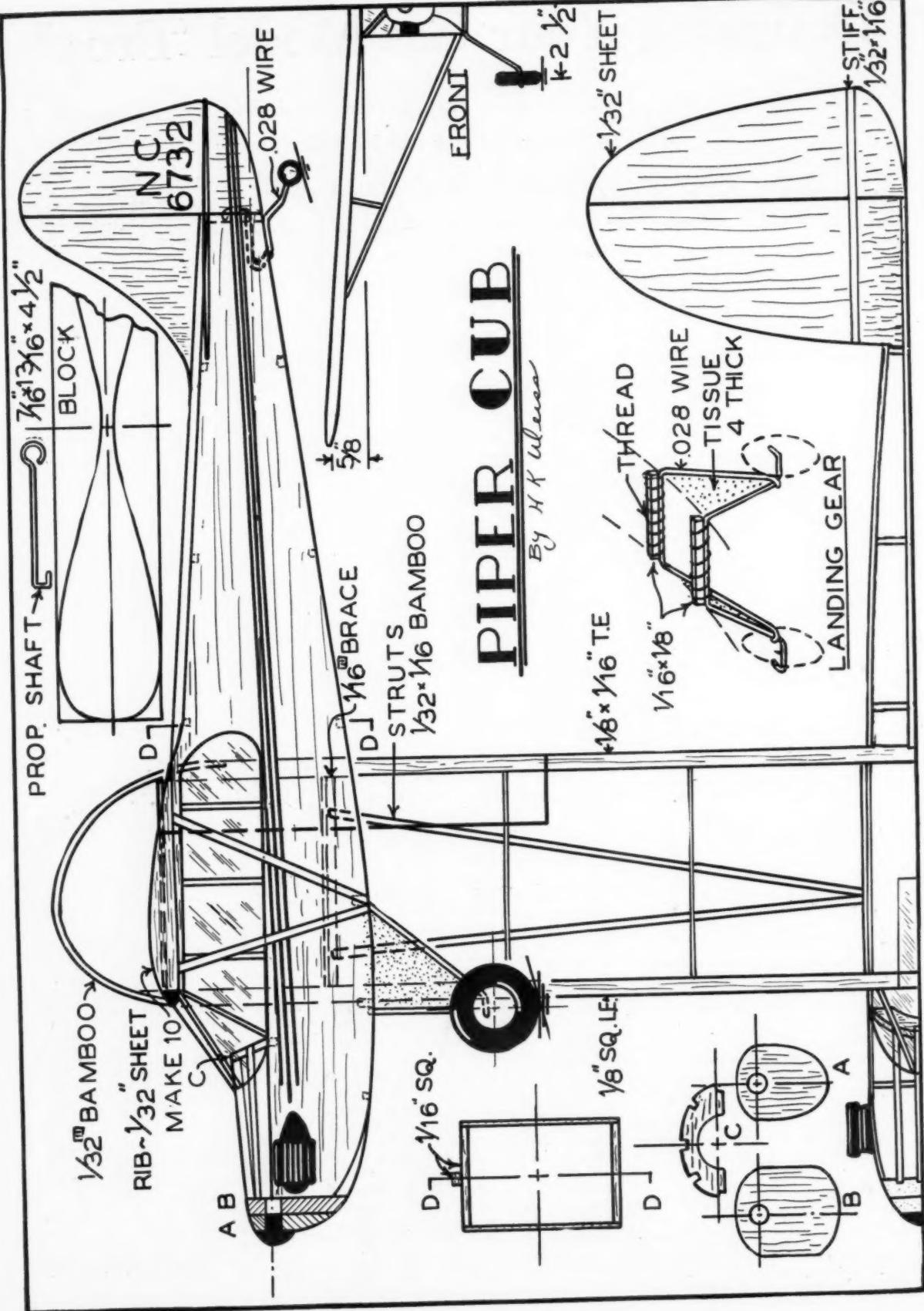
$$D_2 = D_1 \sqrt[4]{\frac{P_1}{P_2} \left(\frac{V_{R1}}{V_{R2}} \right)^3}$$

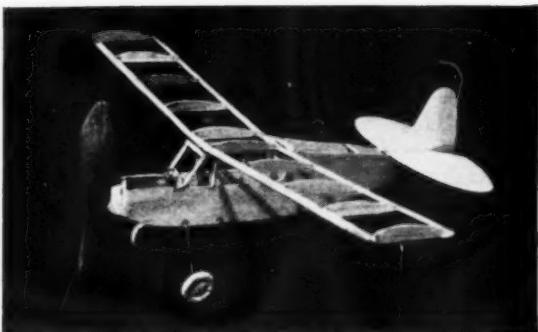
In the formula: D_2 = the diameter; the propeller should be at 5000 R.P.M.; D_1 = the diameter specified at 4000 R.P.M. = 14.2; P_1 = the pitch of the propeller at 4000 R.P.M. = 10 in.; P_2 = the propeller pitch for 5000 R.P.M. = 8 in.; V_{R1} = (R.P.M.) of the old propeller = 4000; and V_{R2} = (R.P.M.) of the new one = 5000.

(Continued on page 67)

PIPER CUB

By H. K. Ulmer





The framework completed but uncovered



The completed model ready for flight

Build the Piper Cub Minute Model

Here Is a Simple Model of a Popular Sportplane That May Be Built in a Few Minutes
Yet Which Will Give Exceptionally Fine Performance

By HERBERT K. WEISS

AMERICA'S most popular airplane today, the Piper Aircraft Corporation's "Cub," is the first ship to really break into the vast potential market of the air-minded public. The Cub is not yet a "thousand dollar airplane," but it is very near to it. With dual controls in an effectively furnished cabin the Cub seems to be giving its owners what they want, as is evidenced by the fact that over a third of all commercial airplanes sold today are Cubs.

Most significant in view of the large volume of Cub sales, is the fact that the Cub's top speed is only 84 miles an hour—fine for such a low powered ship, but nevertheless indicative of the intention of Cub owners to fly as they would drive their cars, safely and with economy.

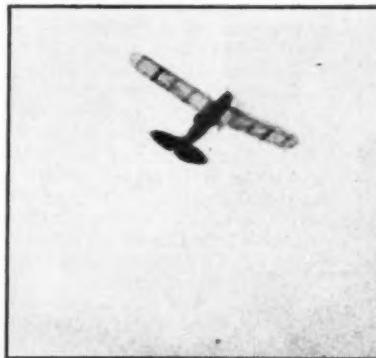
Both aviation and the automotive industry owe much to the first wild spirits who burned the road and air in tricky experimental contraptions, but their number has always been small. A greater development from their beginnings requires the support of many enthusiasts. The Piper Corporation is leading the way in introducing to aviation a large and permanent group of supporters, to the eventual benefit of everyone concerned with aviation.

Our model this month has been designed for extreme simplicity. Because of the light construction, it flies very well.

Fuselage:

With a sharp razor cut out two fuselage sides from $1/32"$ sheet balsa. The outline can be traced on the balsa by putting a sheet of carbon paper under the plan with the balsa under the carbon, then tracing the plan lightly with a sharp pencil. The rudder and stabilizer can also be traced and cut out of $1/32"$ sheet balsa at this time. Sand the pieces smooth on both sides with fine sandpaper.

Now cement the two fuselage sides together at the tail post, using a short piece of $1/16"$ square balsa as the tail post. Cut out former C from $1/16"$ sheet balsa, and A and B from $1/8"$ sheet balsa.



Coming in! (Actual flight)



Climbing for altitude



The little ship is most realistic. Sheet balsa makes the construction simple

Cement the cross braces in place just at the rear of the windows, and follow these with the $1/8" \times 1/16"$ braces at the landing gear. Add former C. Cement A and B together, and attach them to the nose of the fuselage as shown on the plan, using pins to hold them in place until the cement is dry.

Add the remaining cross braces, the tail hook and the landing gear.

Note that the landing gear is all wire, covered with four sheets of tissue.

Wing:

The wing is of standard construction. Make it in one piece, leaving the leading and trailing edge in rough form, and sanding them to airfoil section after assembly. The bamboo wing tip can either be bent over a candle flame, or as the bamboo bends freely, simply bent and tied into place with thin thread while the cement is drying.

Assembly:

Sand the wing and fuselage again to remove any projections which would spoil the covering. Then cover them carefully with tissue. Colored tissue may be used in any color scheme to suit the individual builder. Spray the covered parts lightly and allow them to dry. Sand the "fuzz" down from leading and trailing edges and tack down loose edges of tissue with dope.

Now cement the wing to the fuselage, scraping the tissue from the frames at the joint so that the cement can hold the balsa. Add the tail surfaces, wing struts and wheels. The tissue-covered parts can now be given a coat of very thin dope if desired.

Carve the propeller from a block of medium hard balsa to the size shown.

Flying:

The original model flew very nicely on two strands of $3/32"$ rubber, using about an inch of slack with a winder. A heavier model will need two strands of $1/8"$ rubber, and can probably take almost two inches of slack. The potentialities of these small models are surprising. Our Cub flies half a minute consistently indoors and rides

(Continued on page 35)

"Gas Lines"

Official Section of the National
Aeronautic Association Gas
Model Division

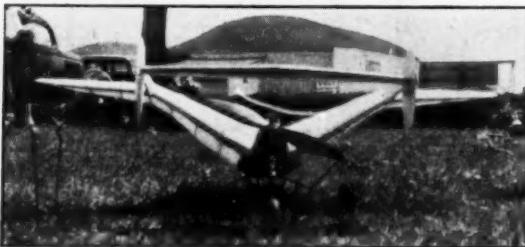
NATIONAL AERONAUTIC ASSOCIATION HEADQUARTERS NEWS



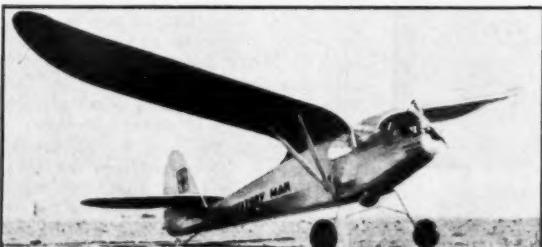
Pict. No. 1. A biplane gas model in full flight at Daytona Beach



Pict. No. 2. Ben Shereshaw and his new motor



Pict. No. 3. An agitated sea-gull? No, only a gas model, believe it or not; built by Warren Robinson



Pict. No. 4. This ship by Elbert Weathers drops its gear after a take off. A landing wheel protrudes from the fuselage

THIS is the last call to all members of the old I.G.M.A.A. who wish the gas model pioneers' certificate, which shall be issued shortly. All that is required of you is that you send in your name and address and when you became a member of the association. All old members who do this will receive their certificate in a short while. This certificate is being given in order that all former I.G.M.A.A. members may have a testimonial of their pioneer efforts in gas model aviation. All those who receive certificates will be listed as members of the Gas Model Pioneers, a permanent association without dues.

The plan is that members of this society will get together from time to time to discuss gas model problems, past experiences and enjoy association with one another. This offer is open until January 1st. After that date those who have not requested certificates and verified their claim for one, will be ineligible for the new association. We advise you to take action immediately!

A flood of news has come into "Gas Lines" from all parts of the country; so in order to cover the ground completely each item will have to be taken up in brief form. We see that Florida is placing itself on the map in the gas

model world. Mr. Charles A. Faraldo of 634½ Mulberry Avenue, Daytona Beach, Florida, writes and tells us that a very large contest was held at Daytona Beach recently, which two thousand people attended. Mr. Faraldo acted as contest director. Picture No. 1 is an unusual shot showing a gas model biplane taking off from the run-way and gaining altitude rapidly. As most gas model builders will realize, this is out of the ordinary; for it is exceedingly difficult to build biplane gas models that perform with a normal degree of stability.

Picture No. 2 shows Ben Shereshaw of the Kresge Model Aero Club, Newark, New Jersey, holding a ship in which is mounted his newest creation; a gas engine of the midget variety. The piston displacement of this engine is approximately .24. We understand that it performs remarkably well and has plenty of power.

Some model builders become very bored with the continual building of orthodox planes. One of these is Warren Robinson of 4922 North Kildare, Chicago, Illinois. He likes to try new ideas and take voyages of discovery through gas model design. Look at picture No. 3 and see what he found on a recent mental sojourn. Robinson calls this a "vacuplane." As you can see, it has a gull wing. The stabilizer is located at the front of the plane on two outriggers. He says:

"I had quite a little trouble in balancing it due to the center of lift being far forward. It flew best with a two wheel landing gear and stabilizer in the rear of a fairly heavy nose weight."

Evidently Robinson has been testing various combinations, and is now redesigning it and is sure it will be a success. The wing span is four feet.



Pict. No. 14. A twin engine seaplane at the Philadelphia meet



Pict. No. 13. Do our eyes deceive us—a model Douglas DC-3



Pict. No. 5 Larry Thirkelsen inspects record model built by Ira Hassad and Mel Anderson. Ralph Hall, right

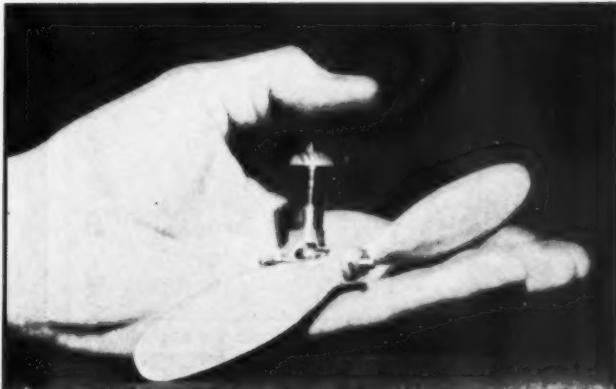
Here is something that appears to be quite new in gas models. It comes from Elbert J. Weathers of 2720 Poinsettia Drive, San Diego, Calif. It is a gas model which drops its landing gear after the take off. There is one single wheel protruding from the lower part of the fuselage on which it lands at the end of the flight. The ship is shown in picture No. 4. As usual with Weathers, the general design characteristics are graceful and efficient. Unfortunately though, such a plane cannot be used in a contest; for it is against the NAA rules to drop any part of the ship when it is in flight.

In his letter accompanying the picture Weathers states that the landing gear is not part of the plane but merely a "dolly or cradle." We beg to differ with him in this respect, inasmuch as the landing gear performs the take-off function of the ship; without it the ship would be inoperative. Therefore it is a necessary, functional part of the ship. Whether it is a part of it structurally is not the question. If what Mr. Weathers says was true, there would be nothing to prevent the model builder from dropping part of the motor unit, such as the batteries, etc., after the engine stops so that the ship would have better gliding qualities due to less weight. Any part of the structure, or object which enables the plane to get off the ground, must be considered as an integral part of the plane.

Mr. Weathers mentions the fact that he has had the method of applying this idea copyrighted for seven years. It seems there is nothing new in model aviation—for your editor used this system of take-off for rubber powered twin pushers as far back as 1910. Mr. Weathers continues:

"The builder of this ship has observed on several occasions that when several other one-wheel landing gear jobs have been flown in California (in every case, one wheel retracted with mechanism straight up into fuselage and wingtip supported until off ground), that each one climbs in a vertical bank, losing practically everything gained; and consequently gaining practically no altitude in a certain time period. Therefore, I felt the real answer lay in the application of a generous curved gull, built into the wing center section. In this way, the C.L. has been separated from the C.G. sufficiently so that it contributes much to the normal climbing bank which the ship has. The coil is just below the side cabin windows and the batteries are end-to-end in a case built vertically into fuselage behind the cabin. The C.G. of the model is just below line of thrust and C.L.A. is in proper relation. The gulled wing and up-curved tips have provided for the utmost in stability. The ship has a neutral setting of the stabilizer and wing, and also a neutral line of thrust.

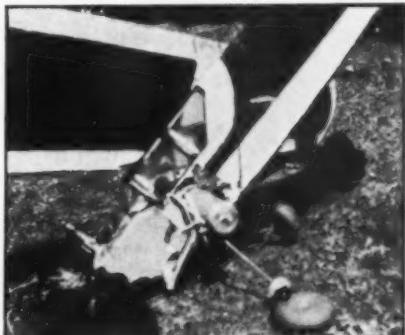
"It flew under power and glided perfectly from the very first test flight, and has flown exactly as calculated on paper. On the glide, it really eats up the raisin currents and for that reason doesn't even 'come down for lunch.' You will notice that the wing loading is .90 lb. per sq. ft., which doesn't bother it materially.



Pict. No. 6 The smallest motor in the world in the hand of its builder, Owen Chapman. The propeller is only 6" in diameter

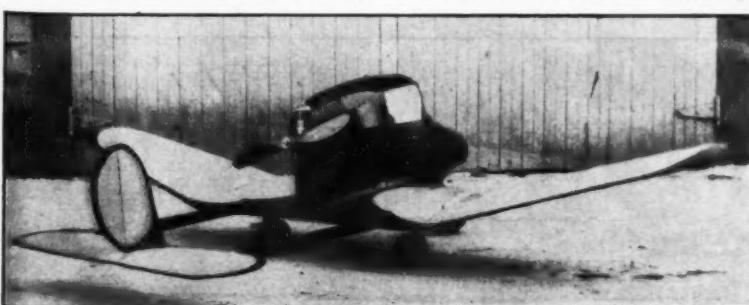


Pict. No. 10. Only a gas model, no fooling, of the Dornier DO-18; built by Ed Radtke. It performs like a real ship too

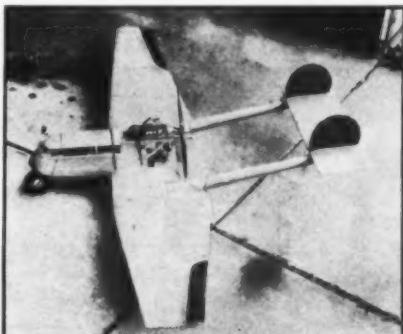


Pict. No. 9. At the end of a perfect flight

However, it will be recovered shortly and given a lighter paint job at which time it won't exceed 3.5 lbs. which will give a 12 oz. loading. This is another application by the writer of the Grant XG wing section and it offers everything plus in the model's performance. The paint job consists of an aluminum paint that is so bright that it looks similar to chromium plating, and at times when aloft in the



Pict. No. 7. A realistic low-wing gas buggy by Harry Durant



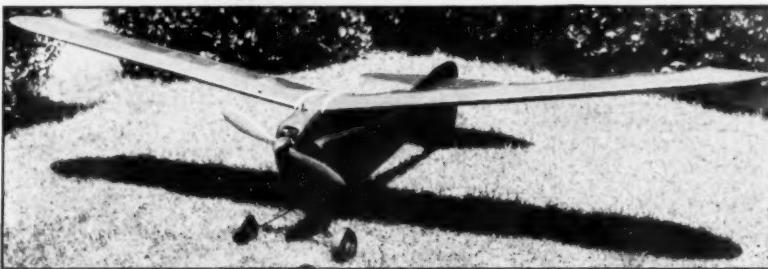
Pict. No. 8. Scott Pearson's low-wing



Pict. No. 19. Carroll Krupp of Akron with his one wheeler



Pict. No. 18. Bud Chapman of Cal. on the field at Akron



Pict. No. 11. One of the sleekest jobs we have seen, by Burnett Gadeberg



Pict. No. 17. Will she or won't she?—Yes!

sun the model is just a blinding flash. "The ship carries a Univex Model 'A' camera (as used on WESTERNER in May-June '38 issues) mounted over the fuselage on the wing center section, which is readily attached when desired. It is mounted with the lens facing the tail surfaces and will include them in every picture, but has not been used as yet. A high grade film is now available for Univex cameras at 15c a roll which will improve the quality of aerial photographs."

In California gas model builders are

going after unlimited endurance flights in a big way. Picture No. 5 shows Mel Anderson and Ira Hassad of Los Angeles with a plane they built which established an unofficial duration record for unlimited fuel of two hours, one minute, fifty-four seconds. Mel Anderson, who materially contributed to the success of the flight, is discussing the event with Larry Therkelsen, timer, and Ralph Hall, pilot of the Stinson which followed the model. Now, however, we hear from Mr. Bill Atwood, also of Los Angeles,

that he has just broken this unofficial record by making a flight of over two hours, forty minutes. Mr. Mel Anderson, on his flight, used a Baby Cyclone engine; Mr. Atwood used an Atwood Phantom.

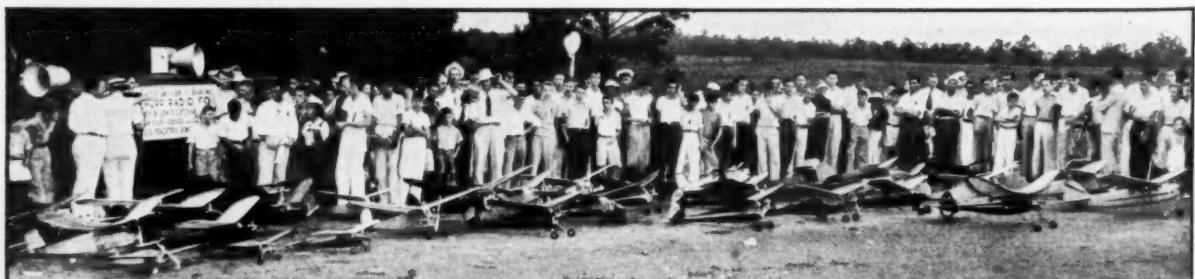
Mr. Owen Chapman of 4616 Lincoln Avenue, Los Angeles, Calif., sends us information about what we believe is the smallest gas engine that has been produced to date. It is shown in picture No. 6 in the hand of its creator. It has a bore of only 5/16" and a stroke of 11/32". The engine alone weighs 3/4 ounce and turns

a six inch propeller at 5000 revolutions per minute. The cylinder is machined from tool steel hardened and ground; the finned head is made from aluminum. The spark plug insulator is of Pipe tubing. All parts of the motor were machined on a lathe that has a swing of eighteen inches and an eight foot bed, driven with a one cylinder concrete mixer engine.

For the benefit of those who are not machinists, we wish to say this is some feat; and parallel to repairing a watch with a monkeywrench!

Here we have another unique ship; built by Harry Durant of 2517 Purdue, W. Los Angeles, Calif. It is shown in picture No. 7. As you can see, it is a low-wing similar to some of the entries in the Department of Commerce's fool-proof airplane contest. The ship flies very well indeed, for pictures of it were submitted which demonstrate its performance ability. Mr. Durant has had plenty of experience in aviation, having been in the Air Corps for twelve years.

In picture No. 8 we have another low-wing plane of excellent flying qualities; built by Scott Pearson of 1224 Park Place, Quincy, Illinois. He tells us that it is basically a Hammond Y; and that his father and he flew it thirteen times, each flight lasting from one to three minutes. This was done without breaking a single part. He says the center of gravity is too far forward and because of this the glide is steep, so they are now taking steps to correct this by moving the center of gravity. A hint may be given here in respect to low-wings: The wing should be at approximately zero degrees with the line of thrust, and the stabilizer at from one to two degrees negative. This will induce a nosing-up effect on the glide rather than a tendency to pitch forward. The wing spread of the ship is fifty inches, and it weighs 2 1/2 pounds; with a wing loading of ten ounces per square foot. An inverted Husky Junior engine is used.



Pict. No. 15. They are interested in models in Atlanta too. A line-up of contestants in a contest held there



Pict. No. 20. R. to L. Maj. Al. Williams, Walter Good and Bud Chapman examine one of the winning planes at the 1938 Jr. Air Races

If you have sensitive feelings we advise you not to look at picture No. 9, for it is one of the sad moments that occurs in the life of every gas model builder at some time or other. Let it serve as a caution to have your plane carefully adjusted for the take off and all flight conditions perfect.

We note the batteries protruding from the wreckage on the fuselage side. This might have been avoided if a demountable or detachable motor mount had been used. In other words, complete demolition of the ship in crash-landings may be reduced to a minimum, if not eliminated entirely, by correct structural design. Many ships are just built without any thought to stresses involved, and invariably they have some weak point which gives way under such conditions as shown. Ships properly designed will take unbelievable abuse, so if you wish to avoid rebuilding your ship after every flight or so—"think before you build it." The unfortunate owner of this plane is Roger W. Maves of 2136 Penn Avenue South, Minneapolis, Minnesota. He says that before the crash the ship made many good flights and was a very stable flier. A strong wind was its undoing.

In picture No. 10 we have a very unusual plane. It is an exact scale model of a German Dornier DO-18. The ship was built by Ed Radtke of 3731 North 24 Place, Milwaukee, Wisconsin. It has a 6-1/2 foot span, weighs 4-1/2 pounds and is powered by a Bunch Mighty Midget engine. It was designed from drawings and photos received direct from the Dornier factory.

Burnett Gadeberg of 2315 Corona Court, Berkeley, Calif., sends us picture No. 11 of his latest design, which is certainly a beautiful job. He says that from tests he has found the strength-weight ratio of the wing is 60/1. The span is 72 inches and the aspect ratio, 7.2. Mr. Gadeberg writes of his plane:

"The cowling is a

Pict. No. 12. Part of the crowd that attended the Mississippi Valley Contest. For them models hold more thrills than the large plane. A Curtiss Robin gas model is in the foreground



Pict. No. 16. The busy workshop at the Parks Air College Model Club. Principles of design are learned by building models

true N.A.C.A. airflow fairing and it is used for flying not for 'looks' The total weight is 45 ounces and even though it is under powered with a Mighty Midget it has a steep climb and a flat glide and responds to even the slightest thermals. It should do well in contests, for which it was designed.

"The single strut landing gear serves a double purpose. First, to absorb and transmit landing shocks in a smooth, even flow to the fuselage to prevent bouncing from side to side and ground looping (which it does excellently) and, second, to form part of the internal diagonal bracing. From the point of entry the struts run diagonally upward and backward until they intersect the motor bearers. Along with a heavy three-ply fire wall these form a very rigid triangle. Every stress in the ship, either flying or landing (even if this is not done on the wheels), is transmitted to this triangle; since the batteries, coil, motor, fuselage, landing gear and even the wings are fastened directly to it. In the event of a crack-up the batteries will not sail out the bottom of the fuselage."

Mississippi Valley Contest

Airplanes crashed one after another at Parks Airport in East St. Louis, Illinois, on Sunday, August 14th, as 328 model airplane enthusiasts, in the face of a 20-mile wind, competed for the 52 prizes in the Sixth annual Mississippi Valley Model Airplane Contest, sponsored by the Stix.

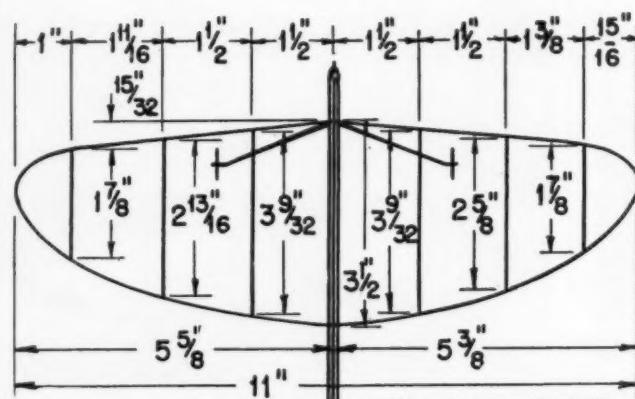


Baer & Fuller Department Store, the Young Men's Division of the St. Louis Chamber of Commerce and Parks Air College.

Crashes were 50% greater than in previous years and, because of the strong wind which didn't die down until late in the evening, no records were broken. Yet all in all, the meet was highly successful, and Contest Director, Bob Sommers (who, incidentally, announced his engagement the very day of the contest), may well be proud of the results. Contestants had come from Arkansas, Tennessee, Iowa, Florida, Wisconsin, Illinois and many other states—and most of the topnotchers in model aviation were represented.

Carl Goldberg of Chicago won the gasoline model endurance contest when his plane remained in the air for 2:22 minutes. Karl Schuenke of Milwaukee was second and Frank Nekimken of Chicago third. The gasoline performance contest, judged on take-off, flight and landing, was won by Roy Marquand,

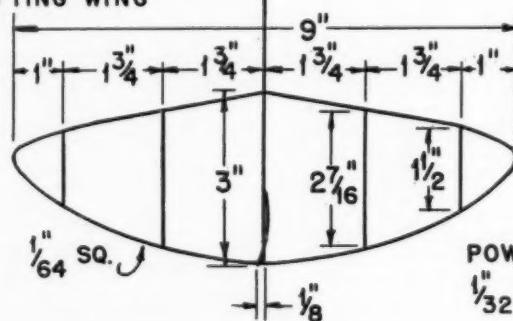
(Continued on page 56)



WHEN BUILDING WING
OMIT CENTER RIB.
COVER, PUT IN DIHEDRAL
WING MT. RIB ACTS AS
CENTER RIB OF WING.
COVER WING MT. BEFORE
SETTING WING

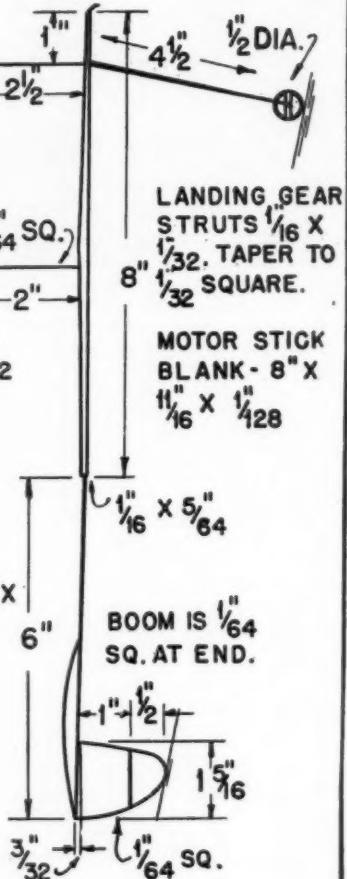
WING SPARS TAPER FROM $\frac{1}{16} \times \frac{1}{32}$
AT C.L. TO $\frac{1}{32}$ SQUARE.

ALL WIRE PARTS SUCH AS REAR
HOOK, BEARING & PROP SHAFT
ARE MADE OF .010" WIRE.



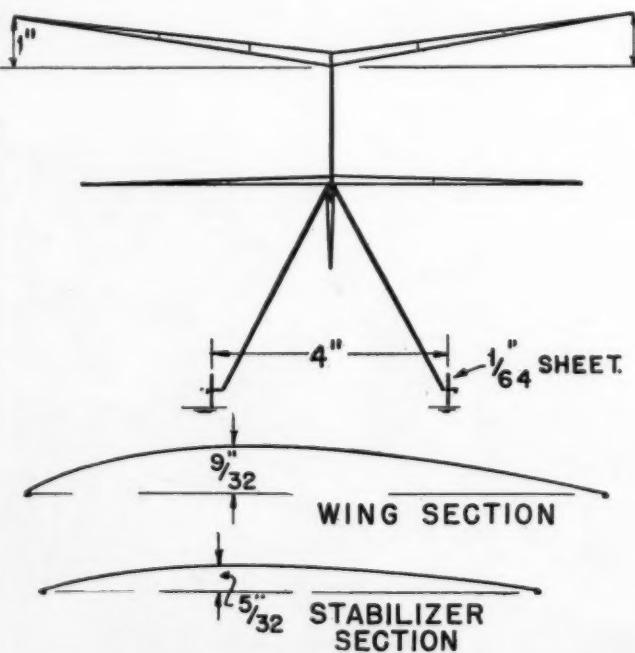
PROP - 8" X $\frac{1}{4} \times \frac{3}{4}$ BLANK.
QUARTER GRAINED.

POWER: 12" LOOP
 $\frac{1}{32}$ BROWN



WEIGHTS

PROP	.004
WING	.0034
M.S. & WING MT.	.004
TAIL ASSEMBLY	.002
LANDING GEAR	.0015
MOTOR	.014
TOTAL	.0289



BABY R.O.G.
8' ON 1500 TURNS
DESIGNED BY: RICHARD WOREL CHICAGO, ILLINOIS.

ARTICLE No. 5

The Physics of the Airplane

An Explanation of the Cause of Forces in an Airplane Created by Circular and Periodic Motions

By LT. JAMES EAMES and WILLIS L. NYE

THE flight path of a modern airplane when executing a vertical bank is a representative example of curved motion. The aeronautical experimenter is accustomed to graceful lines, proportions and motions. Good examples of these are found in the profile curves of modern airfoils, the sleek fairing lines of modern airliners and the maneuvers of a modern airplane during a demonstration of aerobatics. This predilection for geometrical curved lines of fair proportions is attributed to the fluid characteristic of the airflow about the airplane and its path when the structure is subjected to external forces which cause it to maneuver as a body immersed in a fluid medium.

Speed is essential to cause the wings to generate a lift force. The speed element consequently causes the structure to be subjected to certain accelerations and forces. We know that when the airplane flies in a circuitous path of continuous progression and uniform altitude, and if it always passes over an equal linear distance in an equal interval of time, it may be assumed to have completed a period of circular motion of uniform constancy. A maneuver such as this is commonly presented to student pilots in solo flight practice. The magnitude of the airspeed is assumed to be constant. Nevertheless, the airplane in its direction of flight is continually changing in banked flight. We say that the structure is experiencing a definite degree of acceleration. The acceleration is a result of the continuous change in the direction of flight.

It may be taken for granted that a certain force must be applied to the controls to cause a banked, continuous, circular flight in the direction of the motion of the airplane similar to that of the force which is necessary to cause a variation in the airspeed. If the airspeed is not increased, the external force which is applied causes only a relative change in the

direction of motion. This force acts in a line which lies at right angles to the direction of the motion along the circular path. The force acts in a direction which is coincident with the radius of the turn and tends to act in toward the center of this imaginary circle in which the airplane is assumed to be flying. The motion in a true example of circular flight must be continually changing and the force which causes this change must be constant. This force is a centripetal force acting inward and is equal to the centrifugal force acting outward, caused by the mass of the airplane.

form circular motion. For example, we will consider the mass of a section of the propeller to be concentrated at "X" in Figure 1. This mass tends to experience an acceleration in toward the center when the blades are rotating, regardless of the rate of rotation. This example may be clarified to a further extent by saying that the whole mass of the propeller experiences an acceleration in toward the center of rotation at the hub. This acceleration can be determined by mathematical equations. For the sake of simplicity, it may be assumed that if the outer portion of the blade which contains a specific mass passes over an arc, (A-B, Figure 1), at a constant speed of rotation and at a specific interval of time during the progress of rotation, it can be ascertained upon inspection of the diagram that the mass concentrated at the outer portion of the blade is deflected from the straight line distance (A-D, Figure 1), through the equivalent distance (A-E). This is so because the action of the constant force acting in toward the propeller hub.

The following equation illustrates how this acceleration in toward the propeller hub may be determined.

$$\text{Constant Speed} = 2 \times 3.1416 \times \text{Radius of Circle} \times R. P. S.$$

R. P. S.: Revolutions per sec-

ond.

Acceleration toward Hub =

$$4 \times (3.1416)^2 \times (\text{Radius})^2 \times (R.P.S.)^2$$

RADIUS

Note: The value of the radius should be in inches.

The acceleration of the mass at the tip tends to increase as the diameter of the propeller is enlarged or if the number of the r.p.m. per minute is increased. This illustrates the problem of structural design where the strength of a thin blade element of airfoil cross section rotates at curvilinear speeds close to 1,000 feet per second at the extremity of the blade.

The student flyer practicing his first turns flying solo, experiences certain circular accelerations if he rolls into the banked position too quickly or if he tends to overcome the inertia of the moving airplane quickly. For example, if the velocity of an airplane is 120 feet per second and the radius of the turn is 1,000 feet, what will be the acceleration acting in toward the center of the imaginary circle in which the airplane is flying?

$$\text{Acceleration} = \frac{(V)^2}{R}$$

$$\frac{(120)^2}{1,000} = \frac{14,400(\text{f.p.s.})^2}{1,000} = \frac{14.4 \text{ feet per sec.}}{\text{per sec.}}$$

(Continued on page 40)

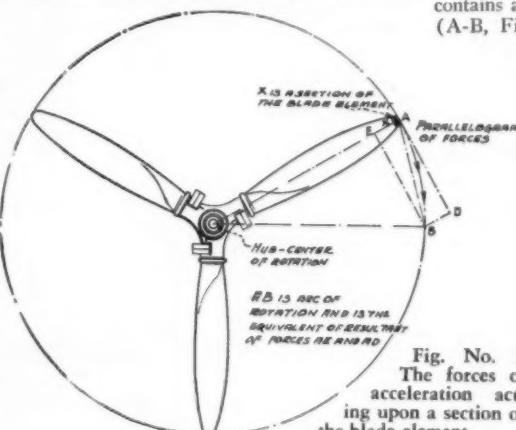


Fig. No. 1
The forces of acceleration acting upon a section of the blade element.

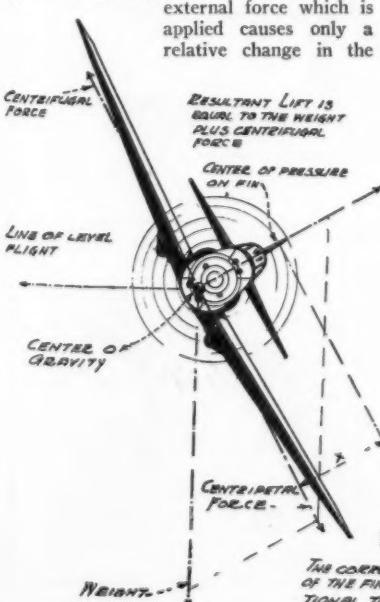


Fig. No. 2. The forces acting on an airplane in a steep vertical bank.
(U.S. Air Corps P-37)

AIR WAYS

HERE AND THERE

What Readers Are Doing to Increase Their Knowledge of Aviation in All Parts of the World. Tell Others What You Are Doing

Air Ways Club News

Original Design Contest

IT APPEARS that scale model builders have been very active recently, for Air Ways Club members have sent us some very unusual "shots" of their handiwork. Picture No. 1 comes from Theodore F. Sharp of 3669 Devonshire, Detroit, Michigan. It is a Northrop A-17 Attack plane, which has been worked out in careful detail and beautifully finished. Though it looks like a solid model, it actually has a built-up frame work covered with sheet balsa. The wing span is twenty-four inches. The motor is a fourteen cylinder twin-row Wasp, made with all the details of the real engine, from drawings supplied by the Pratt & Whitney Company. In the wings are four thirty-caliber model machine guns with a removable hatch above each. A complete system of landing lights and instrument board lights have been incorporated in the model. Another feature is the perforated flaps which you may notice in the picture. This model is certainly the work of a master craftsman.

Joe Walsh of 96 Willis Street, New Bedford, Massachusetts, sends us picture No. 2 of his contest duration model, which embodies the principles used by Vernon Bochle in his 1935 Wakefield job. You will note the high aspect ratio of the wings. Model builders would do well to incorporate this feature in their planes, as it increases the efficiency as well as the stability enormously. The plane has a span of fifty-three inches and a chord of four inches.

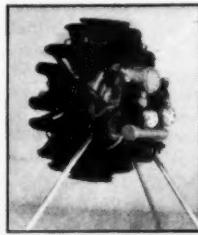
Among the finest model builders in the country are the Doering brothers of Los Angeles. Picture No. 3, believe it or not, shows a model Seversky built by these gentlemen. Apparently it is a full size ship either landing or taking off from an airport. The details of the ship and the setting have been so well worked out that it is nearly

impossible to distinguish this model from an actual ship. For this information we are indebted to Mr. V. R. Stiles, 1044 Fairview Drive, La Canada, California, who does all the photographic work for the Doering brothers. He tells us that a replica of the model in the picture has been ordered by an army pilot. The price of the model is \$300.

Henry Clark of 46 Fort Washington Avenue, New York City, one of our active aviation photographers, is also a scale model builder. He sends us a picture, No. 4, which shows one of his scale models. He says:

"I recently rebuilt and repainted an old army Boeing P-12 and made it into another type altogether. The result is the ship shown in the picture; a navy Boeing F4B-3."

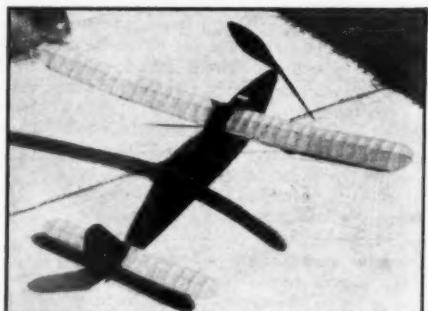
Examination of this picture will disclose all details of the big ship, many of which builders do not usually include in



Pict. No. 4 and No. 5. A midget motor and a perfect scale Boeing F4B-4 by Henry Clarke



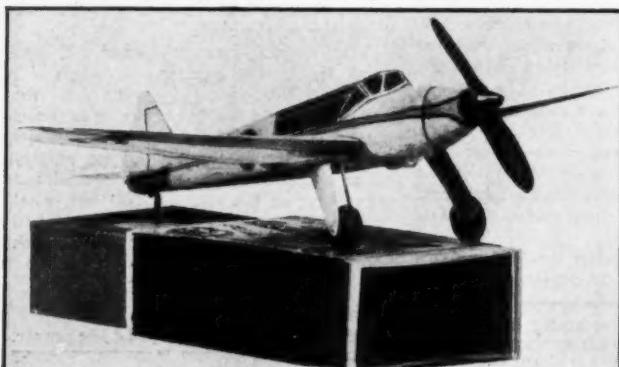
Pict. No. 1. Ted Sharp's perfect built-up scale Northrop A-17



Pict. No. 2. A high aspect ratio duration job by Joe Walsh, a beautiful soarer



Pict. No. 3. No, this is not a real ship. It is just another perfect model by the Doering Brothers; a Seversky Pursuit



Pict. No. 9. A paper model you can put in your pocket, by W. Rigg



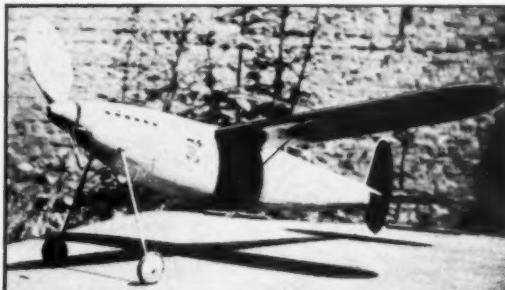
Pict. No. 8. A fine G. B. by Roy Scottine



Pict. No. 11. Members of the Southland Model Aero Club, N.Z.



Pict. No. 10. Members of the Lancashire Model Aircraft Society



Pict. No. 12. Alfred Van Wymersch's Wakefield model, voted the most beautiful model at the international contest. It placed third

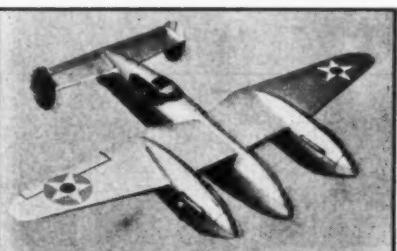
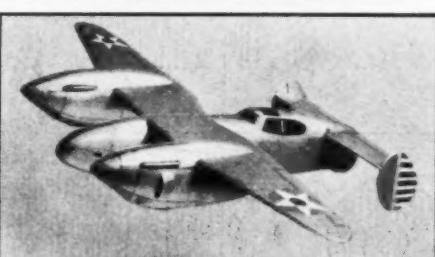
Pict. No. 13. This is what they do in Russia. Young Soviets get acquainted with model hydro-

their models.

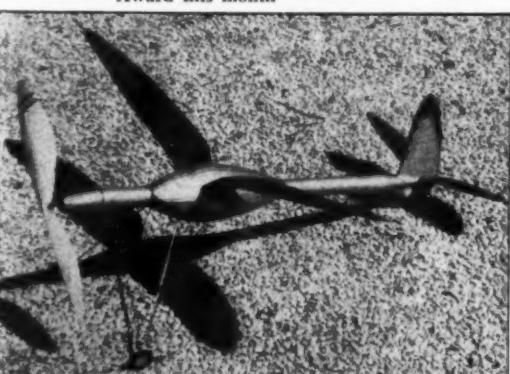
Picture No. 5 shows a rear view close-up of a Pratt & Whitney "Hornet" which Henry Clarke also built. The motor is composed of 150 individual parts. Henry puts it rather naively:

"It may not be a knock-out but it certainly is detailed. All parts are balsa except for a reed ignition conducting ring, reed intake pipes and the ignition wires. The push rods are dowel. The complete motor is two and a half inches in diameter."

One of the ships of very unusual design that we have ever seen is shown in picture No. 6. It is a Wakefield model built by Ed Seugwoda of 1940 Macdonald Avenue, Brandon, Manitoba, Canada. Seugwoda has solved the problem of the fuselage cross section in a most novel manner. The maximum cross section fills the bill, though the construction has been cut to such an extent that the weight is kept to the minimum. He tells us that the center of gravity is on the same level with the



Pict. No. 14-No. 15. Howard Wolf's solid scale dream ship which wins the Originality Award this month



Pict. No. 6. Ed Seugwoda's unique Wakefield job



Pict. No. 7. Bill Bouldin's one-wheel tandem DeLanne fighter

center of lateral area, and that the ship is of unusual stability and an efficient flier. However, he says on its last flight, at the Winnipeg Contest, the retractable wing mechanism worked too well. In other words, it cracked up.

Mr. William Bouldin 3rd of 169 Prospect Street, East Orange, New Jersey, has had another brainstorm; and, as usual, it is a pretty good one. It is always interesting

to try something different and to discover new things in the field of design. Lately Mr. Bouldin has experimented with a tandem in which the center of gravity is well back of the trailing edge of the front wing. The tail surfaces are extremely large and carry a major per cent of the weight of the model. Another feature is a single wheel. The two stabilizer fins rise above the ground so that the model remains upright instead of keeling over. It has a span of thirty-four inches; employs an R.A.F. 32 wing section. Actually it is a scale model of the French DeLanne fighter. This latest creation of Mr. Bouldin's is shown in picture No. 7. He says it flew very well on the first flight without much adjustment.

Picture No. 8 shows a model of one of the old Gee-Bees. The interesting part of this ship is that it was built by a ten-year-old model builder, Roy Scottine of 3201 Stockbridge Avenue, Los Angeles, Calif. The youngsters are rapidly progressing in the art of model building. More power to them!

(Continued on page 62)

DRAWN BY
ELBERT J. WEATHERS

AIRCRAFT INSIGNIA
OF THE WORLD

12-14-37

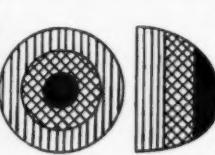
KEY TO
COLORS



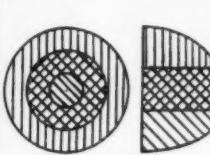
ARGENTINA



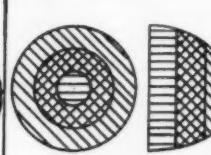
BELGIUM



BOLIVIA



BRAZIL



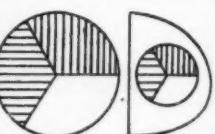
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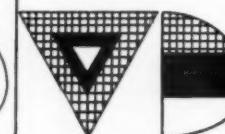
CHINA



CZECHOSLOVAKIA



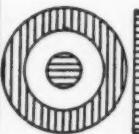
DENMARK



ESTONIA



FINLAND



FRANCE



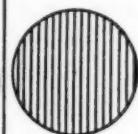
GREAT BRITAIN



GREECE



ITALY

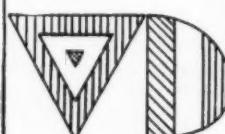


JAPAN



LATVIA

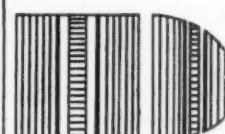
LITHUANIA



MEXICO



NETHERLANDS



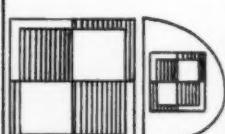
NORWAY



PARAGUAY



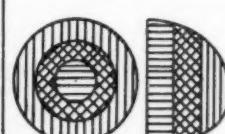
PERSIA



POLAND



PORTUGAL



ROMANIA



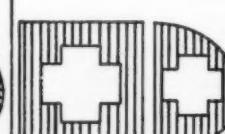
SIAM



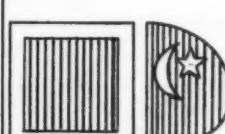
SPAIN



SWEDEN



SWITZERLAND



TURKEY



URUGUAY



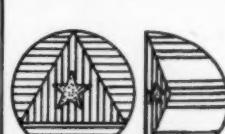
UNITED STATES



RUSSIA



YUGOSLAVIA



CUBA

A Gas Model Range Finder

How to Make a Simple Instrument by Means of Which You May Determine the Altitude of Your Model When It Is Overhead

HOW many times have you gas model builders wanted to know the altitude attained by your planes? The writer was interested in that information, so this simple but surprisingly accurate instrument was conceived. It does not operate on the principle of geometric triangulation, as does the type used in military tactics, but functions instead on simple laws of proportion. It has a capacity of 3200 feet, which is plenty of altitude for any gas model.

In examining the scale you will see that a base factor of 25 feet has been selected as most convenient. From "1" to the center, each step (1-2, 2-4, 4-8, etc.) is just half the length of the preceding one. Hence, if a model's wing span is viewed on the ground between 1-1 at 25 feet distance (the chosen factor of proportion) and when the ship is in the air and the wing fills, for example, the space 4-4, the factor (25) is multiplied by four to obtain the altitude; which is 100 feet in this case. As another example, if the wing should occupy in the air the space of 32-32, the height of the gas job would be 800 feet (25×32).

To use the instrument, the observer holds it in such a position in front of him that he may get a good "sight" on the scale with the eyes. The end of the handle is held

By ELBERT J. WEATHERS

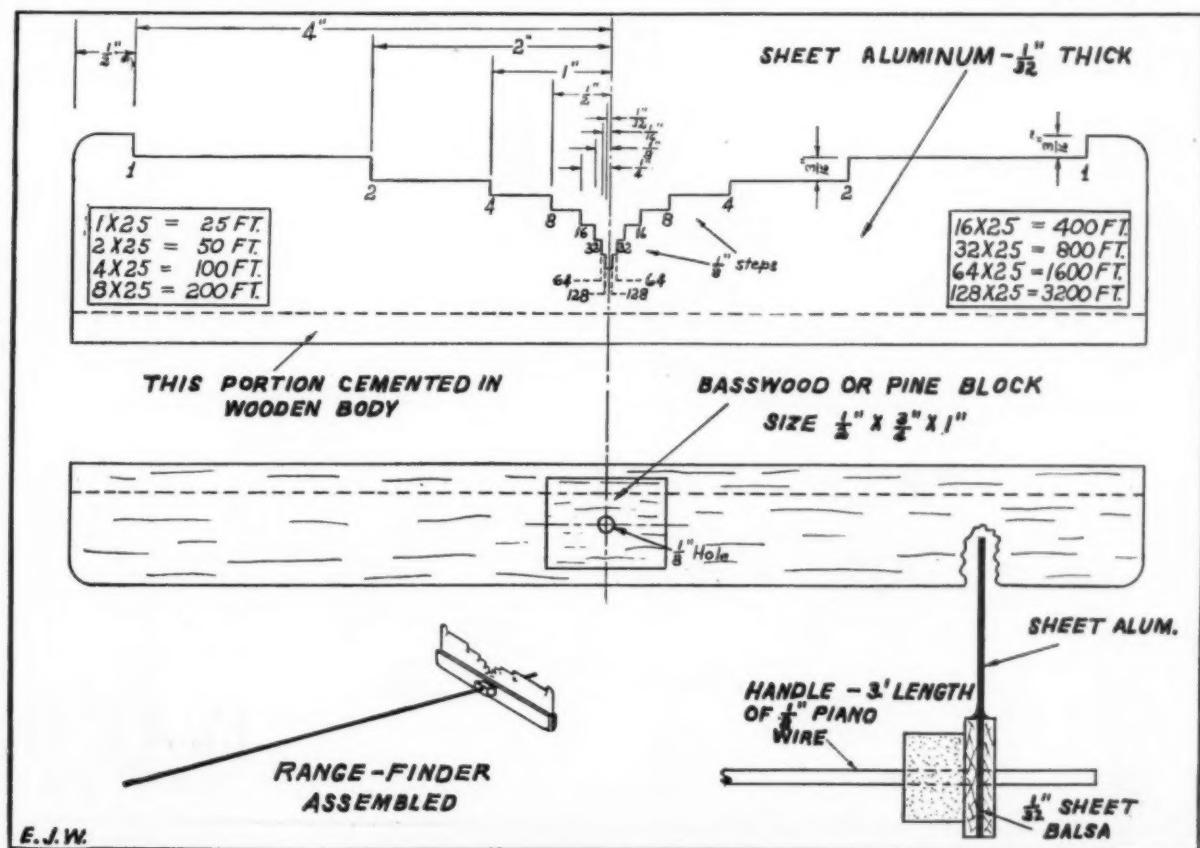
about two inches from the nose, using the right hand. The other end of the handle upon which the sliding cross-member containing the scale is attached, is supported by the outstretched left hand; the fingers grasping the handle from the underside just in front of the sliding scale unit. In using the range-finder, it is important that this position of it in relation to the observer be assumed, both in "sighting" the model on the ground and when it is in the air.

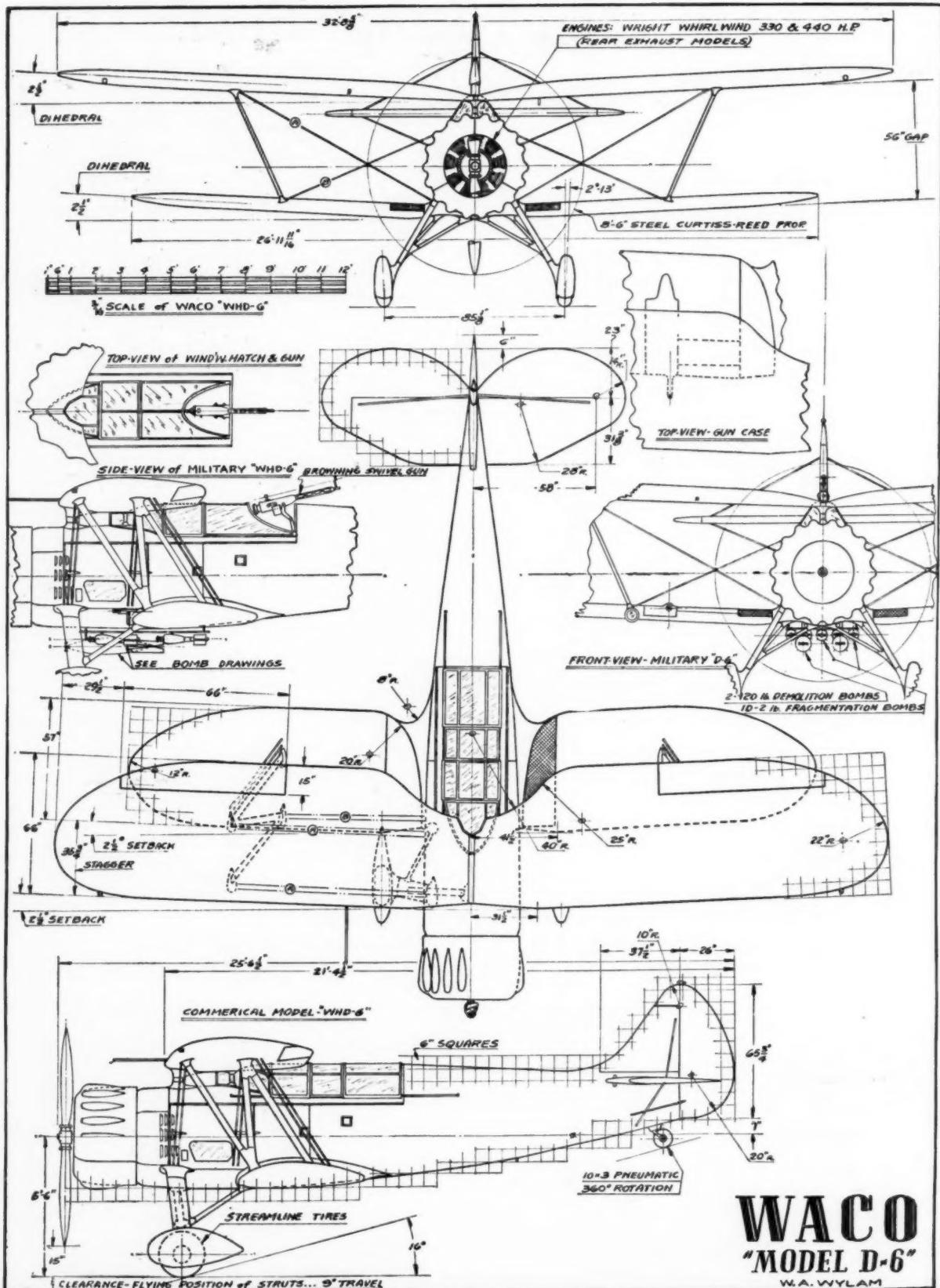
The gas model is placed on the ground in front of the observer at the 25 foot distance, so that a direct front view of the plane is obtained. Now, standing the designated distance from the model and holding the instrument handle about parallel to the ground, "sight" the wing tips and adjust the scale back and forth on the rod until the wing span just fills the space "1-1." It is now ready to use. Proceed to put your ship in the air and when ready to view it as it is circling overhead, with the wingspread in a line across the scale as it was on the ground, take a "sight" on it and quickly note the section of the scale it now fills. If it happens to be "16-16" a hasty glance

at the chart shows the plane to be at an altitude of 400 feet. The figures will of course be rapidly memorized, but for initial trials the user will find the chart of computations handy. Just a word of caution: In using it, the model must be right above the observer with the "finder" in practically a vertical position. Otherwise, should it be used on the plane at an angle of definite value between that of 180 degrees (the ground) and 90 degrees (perpendicular to the ground) quite a little distortion would result in the computed altitude figure, as geometric triangulation would then be involved.

To begin the actual construction, the scale or business part is first made. It is formed from a piece of $1\frac{1}{4}'' \times 9''$ sheet aluminum of approximately $1/32''$ thickness. Scribe the center line and lay out accurately each station from the center line out to the end of each half. Using this center line of the metal strip as one end of each span of measurement, measure consecutively from $1/32''$; $1/16''$; $1/8''$; $1/4''$; $1/2''$; $1''$; $2''$; and $4''$. With tinsnips, complete the scale as shown. Now make up the wooden body which supports the metal strip. Secure two pieces of hard

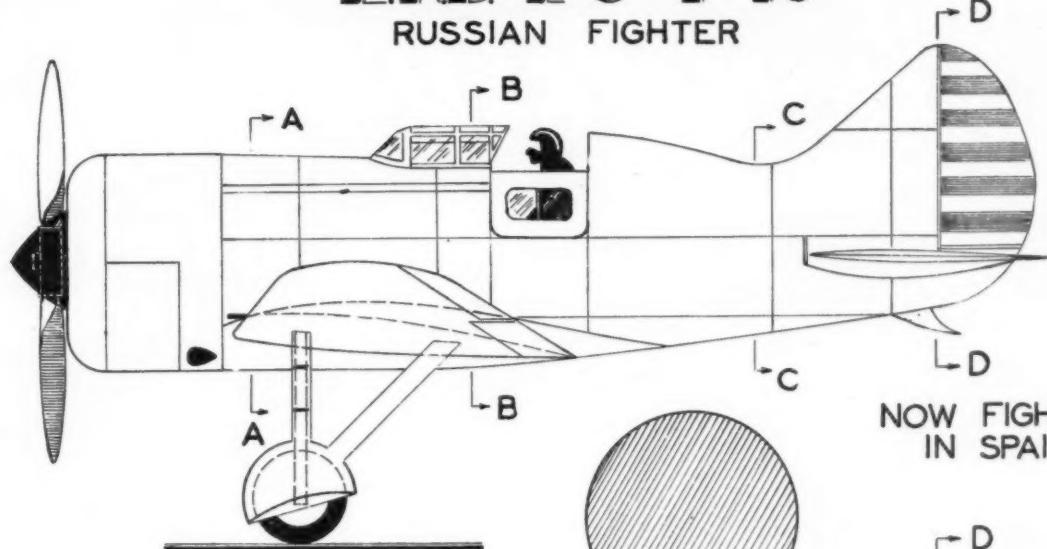
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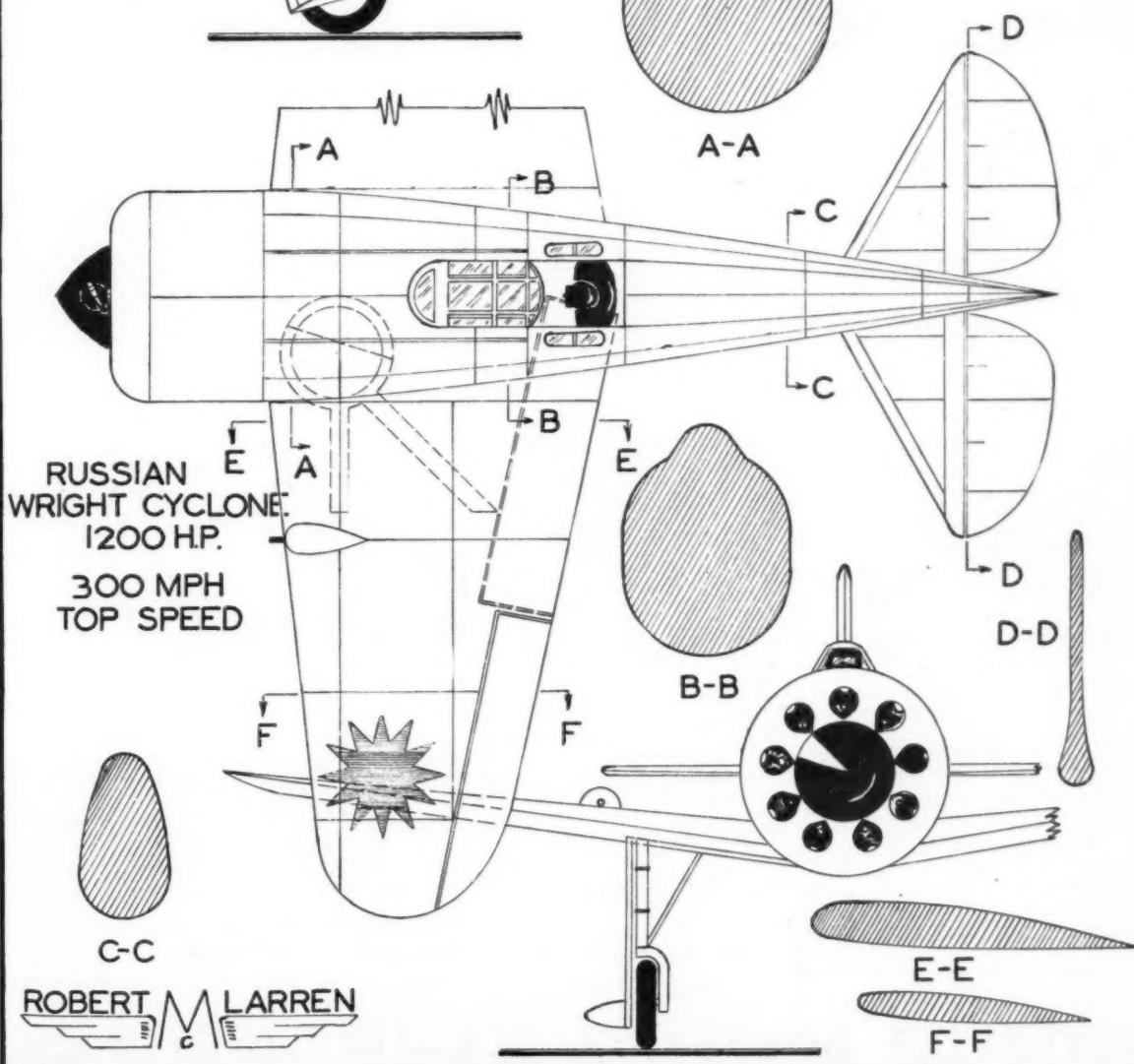


WACO
"MODEL D-6"

Z.K.B.-2 I-18
RUSSIAN FIGHTER



NOW FIGHTING
IN SPAIN





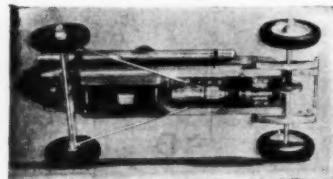
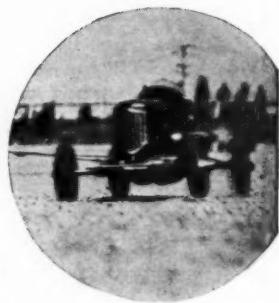
Now you can own a perfected gas powered race car—the 20" Speed Demon—backed by 2000 miles of racing tests. Designed after the Indianapolis Race Cars the Speed Demon brings you all the thrills, action and excitement of this famous speed Classic.

Any street corner, parking lot, tennis court or playground is your speedway with the Speed Demon. With wheels set to run free or guided with a line attached to the frame the Speed Demon runs in any size circle. The engine is started—the clutch engaged—and the Speed Demon knocks off lap after lap at 30 to 50 M. P. H. (with standard drive ratio).

Not an ordinary model kit, the Speed Demon kit makes up a machine composed of manufactured parts from clutch to air cleaner. All assemblies are built up. Simply bolt together and assemble the car as illustrated. The drive shaft with universal is fitted with bronze bearings in a drive shaft housing. The front axle assembly with front wheel "clutch drive" perfected by Bunch Engineers is machined and finished. Drilled engine mounts bolt to shaped frame rails. Rear axle assembly with radius rods is prefabricated and quickly attached with a bolt. All assemblies and parts are electroplated.

Pneumatic automobile tread tires, wheels, aluminum hood and shaped body and radiator blocks complete the Speed Demon kit so anyone can assemble in a few hours. The ability to build delicate airplane structures or special tools and drills are not required. Complete instructions explain racing methods free from the hazards of airplane crackup.

Providing thrills of a full size racer the Speed Demon flashes past, reeling off the laps with the precision of an Indianapolis winner.



Underview of chassis reveals practical front wheel "clutch drive", drive shaft housing, and front and rear axle suspension.



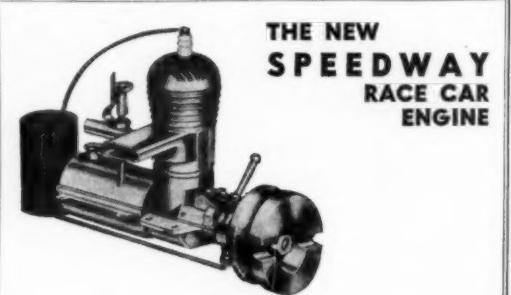
Hood removed shows accessible motor installation. Air cleaner is in cockpit. Adjustable radius rods steer car from rear.

SPEED DEMON

Race car assembly kit — Complete (less motor) — immediate delivery.

\$16.50 Postpaid.

SPEED DEMON PLANS
\$1.00 Postpaid



THE NEW SPEEDWAY RACE CAR ENGINE

Developed especially for the severe running conditions imposed by race cars the Speedway with special crankshaft and flywheel for automotive drive runs clockwise and has the exhaust on proper side for race car stack attachment. The Speedway—not a stock aircraft engine—is set up with tested clearances and tolerances and equipped with piston rings. A few laps with a race car are possible with many engines, but exhaustive running tests prove the Speedway to stand the "gaff" required of all racing automotive engines large and small. Horse Power $\frac{1}{4}$ at 8500. Bore $\frac{7}{8}$ ", Stroke $1\frac{1}{16}$ ".

SPEEDWAY — Assembled.....	\$14.00
SPEEDWAY — ENGINE KIT.....	\$11.85

Bunch Model Airplane Co.
5007 So. Hoover St.,
Los Angeles, Calif.

Enclosed find postal money order. Please rush me:

One Speed Demon Race Car Kit
 One Speedway Engine, Assembled
 One Speedway Engine, Kit

Name.....
Street.....
City..... State.....

**ORDER
TODAY!**

Race car assembly kit — Complete (less motor) — immediate delivery.

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SCIENTIFIC

MODELS ARE IMITATED —
SCIENTIFIC CREATED THE GAS TYPE MODEL
ORIGINAL OFFERS YOU SO MUCH MORE IN INN,



COMMODORE DeLuxe Gas Model

This new Scientific gas model has been designed by the well known "Eagle" gas model designer Mr. J. W. Shershaw. The "Eagle" proved so successful that demands were made by hundreds of modelers for a larger model of this type by the same designer. In this new model Mr. Shershaw has combined all his knowledge and efforts to build what we believe the finest gas model in America. Listed here are a few of the outstanding features of the "Commodore":

1. Mono Strut landing gear. Designed to insure against noseovers in the roughest of fields.
 2. Stressed to withstand loads twelve times in excess of that occurring in the severest crackups.
 3. Differences between power-on and power-off flight altitude have been cut to a minimum, resulting in the elimination of a critical dip after engine has cut.
 4. Absence of spiral dive tendencies.
 5. Efficient aerodynamic design resulting in a very flat glide ratio and low sinking speed.
 6. Trim flaps for finer adjustments.
 7. Semi-monocoque wing stressed to resist all torsion and bending imposed in flights and landings.
 8. Semi-monocoque construction throughout wing and fuselage structures.
- Any inexpensive $\frac{1}{2}$ horsepower engine may be used. On many test flights the "Commodore" was powered very successfully with the Brown Jr. Model D engine. Other engines such as the Ohlsson, Midget, Gwin, Dynamite, Synero, or any other reliable make motor may be used with success.
- Kit is 100% complete, including highest quality sheet and strip balsa, finest spring steel wire, all metal fittings, ignition wire, large full size plans with explicit instructions, all necessary liquids, etc., etc.
- Complete kit, less wheel.
- Complete kit, including a pair of $3\frac{1}{2}$ " Scientific Pneumatic rubber wheels.



Wingspan	6 feet
Overall length	50"
Wing Area	5.2 sq. ft.
Total weight with motor and ignition mounts	$3\frac{1}{2}$ lbs.
Air Speed	Gottling 540
Glide Ratio	16 to 1
Rate of Climb	Approx. 700 ft. per min.

MISS AMERICA Gas Model

NOW HOLDS WORLD'S RECORD WITH FLIGHT OF 46 MINUTES WITH 27 SECOND MOTOR RUN.

Word has just been received from N.A.A. headquarters at Washington confirming this flight made by Mr. Carl Phenix of Galveston, Texas.

Kit is 100% complete,

with $3\frac{1}{2}$ " Pneumatic wheels, 1" tires, wt. (less motor) $2\frac{1}{2}$ lbs. 22 miles on one oz. fuel; 18 to 1 Glide.

\$7.50
P.P.



BREAKS WORLD'S RECORD!



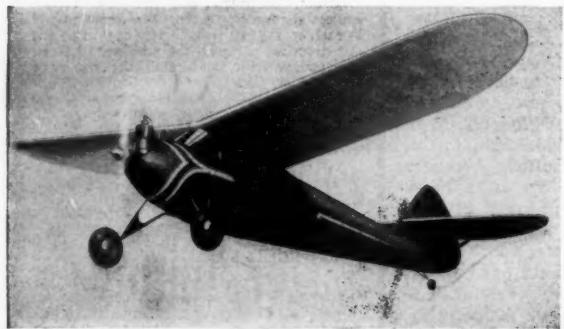
THE STREAMLINER

This new type Gas Model is remarkably true to Big Plane scale and still retains contest model performance. In test flights it has shown unusual efficiency and proven itself repeatedly. It is absolutely crashproof. Has detachable wing, adjustable rudder control, and stamped nose cowling which completely hides engine—with hinged hatch for accessibility.

COMPLETE KIT with Ready-made balsa ribs with patches for assembly. Complete Metal nose cowling with engine hatch, liquids, all metal parts, cut to correct sizes, nuts, bolts, electrical connections, celluloid, rubber, bamboo paper, large full size detailed plans giving every bit of information needed for building and flying the "Streamliner" with instructions for installing any type gas engine.

Complete kit, less wheels, at your dealer or **\$4.95** Postpaid

Complete kit, including a pair of $3\frac{1}{2}$ " pneumatic rubber air wheels, only **\$5.95** Postpaid



THE EAGLET

44" Wing

Flying Weight 17 ozs.
Truly the Finest Midget Gas Job Offered to the Gas Model Builder Today.

DESIGNED FOR USE WITH MIDGET GAS ENGINES

The trend in the size of gas models today is towards a ship of about three to four feet wingspan, and corresponding light weight. Even novices will find the "Eaglet" easy to assemble. The "Eaglet" won 2nd and 3rd places at recent Philadelphia gas meet, taking first place by only 4 seconds. Flew out of sight in 2 min. 12 sec. or only 25 second motor run.

\$3.95 POSTPAID
Or At Your Dealer's

THIS MODEL HOLDS CHAMPIONSHIP OF FRANCE WITH A FLIGHT OF 1 HOUR 20 MIN.



NOW ONLY
\$4.95
POSTPAID
(Less Wheels)
With $3\frac{1}{2}$ "
Pneumatic
Rubber Wheels
\$5.95 postpaid

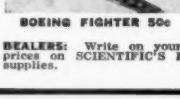


Seven Red Zephyrs entered at National Contest by Iowa Model Club

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WHEELS	3 1/2" pr. 140c	
WHEELS	4" pr. 160c	
WHEELS	4 1/2" pr. 180c	
WHEELS	5" pr. 200c	
WHEELS	5 1/2" pr. 220c	
WHEELS	6" pr. 240c	
WHEELS	6 1/2" pr. 260c	
WHEELS	7" pr. 280c	
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WHEELS	166 1/2" pr. 6660c	
WHEELS	167" pr. 6680c	

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FOR
HEAVY**BAM-BOO
TISSUE****Colors: Natural, Red, Yellow,
Blue and Green—all brilliant**

Ref. from Phila.: "We have run tests on Star Brand AMERICAN BAMBOO PAPERS and find them far superior to any that come from Japan. Panels covered with the paper have been tested for resistance to punctures, with falling lead shots. In every case we had to drop the weights twice as far on the AMERICAN paper as on the Japanese. Furthermore, the new paper presents a smoother surface, dopes nicely and does not have objectionable fibers raised above the surface."

GAS
MODELS

JAPANESE TISSUE
Brilliant
THIN AND STRONG
**** In 32 Colors ****

JAP PROPS**STANDARD TYPE****BROAD BLADE**
50% More Efficient**STEEL TYPE****MINIATURE
CELLULOID
MOTORS**4 sizes: 1½"; 2"; 2½"; 3"
Another Japanese Import

These lightweight motors have been designed to our specifications. Every detail of the original radial engine has been accurately reproduced even to the coil plate at the front. They are to displace the same amount or more than other similar motors. At Whitfield's low prices they can be easily included in every flying model kit.

We Pay Shipping Charges**WHITFIELD PAPER WORKS**

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Established 1869

doors are wide and have a slight curvature which further increases the roominess of the cabin. Pyralin windows are of the adjustable type and permit no-draft ventilation.

The cabin is completely upholstered to give it the appearance of the modern automobile interior. The seats are deeper and more comfortable, and are of molded paratex beautifully upholstered in tufted mo-rocco leatherette in shades to harmonize with the exterior colors, tish-tish.

Flight instruments are centrally located on a broad curving panel which is designed to accommodate additional instruments. The streamlined cowling around the engine adds to the appearance of the ship, as well as the speed, and has proved very successful. It will be standard equipment on all Aeroncas. Specifications of the new Aeronca are as follows:

Wing Span—36 feet; Length—21 feet; Height—6 feet, 7 inches; Empty weight—650 pounds; Gas—12 gallons; Oil—4 quarts; Baggage—40 pounds; Useful load—480 pounds; Gross weight—1,130 pounds; Wing loading—6.68 pounds per square foot; Power loading—22.6 pounds per square foot; High speed—100 miles per hour; Cruising speed—90 miles per hour; Landing gear—32 miles per hour; Rate of climb—550 feet per minute; Gliding angle—1° to 1; Service ceiling—14,000 feet; Cruising range—250 miles.

The Clark Aircraft Company, which is 33-1/3 owned by Fairchild (to complicate matters), has been flying their new Bakelite and wood-molded airplane quite often; and it has been seen at many of the airports in the East. It has gained its A.T.C. The Army Air Corps has been interested in their Duramold process but as yet nothing has materialized.

V-12 Fairchild Ranger engines have been installed on a new twin-engined Koolhoven transport in Holland. The plane has been designed for the Turkish government. The engines are located in the leading edge of the high-winged airplane and are cowed somewhat in the same manner as the V-12 Gipsy engines in the DeHavilland Albatross. But mentioning the Albatross brings up another matter. By this time most of you perhaps have heard of the Second Albatross built and its fuselage cracking in two after landing, which is more or less proof of the uncertainty of wood construction. However, it was not so long ago that the tail fell off of one of our modern all-metal airplanes. The DeHavilland company states that it will have the trouble remedied in short order, so we may see the Albatross over here at a later date. The ship that fell apart had been destined to fly the Atlantic soon and had been going through over-load tests which weakened its structure.

From France comes news that André Japy, noted French long-distance flier, is having Caudron build him a new twin-engined plane for future long speed hops. 220 horsepower Renault engines will power the plane. It will carry a load of fuel for a 4,660 mile range and will only have a wing area of 172 square feet.

The Army Air Corps have advertised for bids on single-engined observation planes to be opened February 23, 1939,

and Vultee may enter a revamped version of their attack-bomber in it. In the past year or two Vultee has delivered attack-bombers to the following: 30 to China at \$970,000; 40 to Turkey at \$3,000,000; 50 to Russia at \$2,000,000; 26 to Brazil at \$1,790,000; 7 to the U.S. Army at \$297,180. Some of the figures given are perhaps planes without engines.

Mr. Berliner of Berliner-Joyce fame and Mr. Fred Weick of nose-wheel fame, are associated with a propeller concern that has the prospects of becoming as well known as Curtiss and Hamilton-Standard. One of their new propellers has a diameter of about seventeen feet and is now under test by the Air Corps!

It is said that several of the new Vought low-wing scout-bombers have been equipped for service test with reversible pitch propellers for use in dive bombing by the navy. The propellers, when reversed, cut acceleration in half to ease the pilot's strain on those terminal velocity pull-outs. Vought has been test-flying a brand new scout-bomber. It is a mid-wing airplane with enclosure running almost the full length of the fuselage. A new type slotted flap developed by the N.A.C.A., which develops a lift coefficient close to the Fowler flap is said to be installed.

There was an error in the September 1938 issue of M.A.N. The photo of Earl Ortman's Kieth Rider racer should have been credited to William T. Larkins of Oakland, California, who contributed it to this article.

How to Build a Model of Col. Roscoe Turner's Thompson Trophy Winning Racer

The plane is easy to build and is a good one for the beginner to start on. Get the dimensions for purchasing material from the plans. Supplies may be bought at your nearest model shop or from the supply companies advertising in this magazine. If you wish to square-off the plans, making it easier for measuring, joint the corresponding dashes on the border with straight lines. Each square will equal one square foot.

Balsa wood is to be used throughout in

Announcing The New Travis Multi-Flex Bearing with Free Wheeling Clutch



One of the smoothest operating and most dependable Free Wheelings ever yet offered, plus—

- 1 Bearing is mounted in universal "Floating Power" support. Is light in weight.
- 2 Completely disengages motor from shaft.
- 3 Is positive. No springs or balky parts.
- 4 Shaft is rigid in prop. Prop does not spin on shaft.
- 5 Clutch is to rear of bearing.

Travis Multi-Flex Bearing with Free Wheeling Clutch
T.M.F.B. without Free Wheeling Clutch

Prices apply to style for use on motor stick model or motor stick or fuselage model.

Dealers write for prices. Our discounts allow you a good margin of profit.

TRAVIS MODEL AIRPLANE CO.
Colorado Springs, Colorado

BUNCH MOTORS
RECORD AMAZING
THRUST . . .

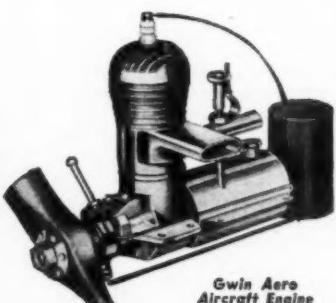
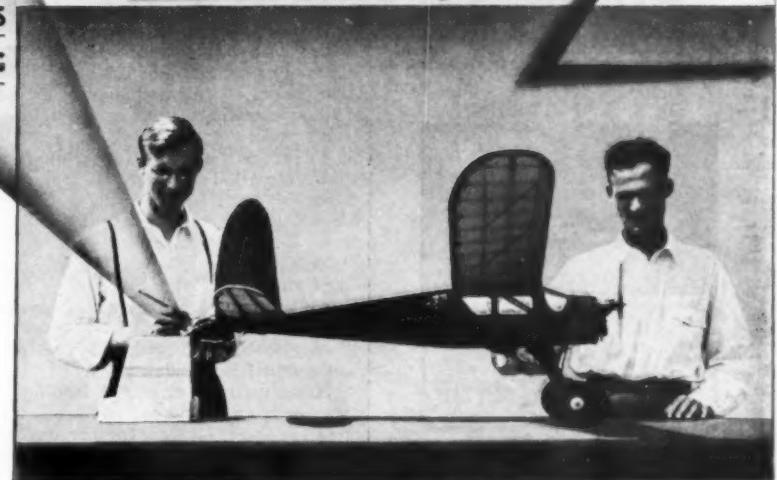
Registered Z HORSEPOWER

● Here you see a Gwin Aero motor exerting a constant thrust or "pull" measured on a scale at 3 lb. 2 oz. This test actually proves the new power yield and stamina built into Bunch power ported engines.

Bunch Engineers have developed 1/5 h.p. engines smallest in dimensions, lightest in weight and now with an amazing registered horsepower equal to the all up weight of many gas models. Your choice of a Bunch motor with this extra margin of performance and engineered dependability will provide the utmost in gas model contest and pleasure flying.

Each type Bunch motor is an honest accomplishment produced by skill, experience and clever engineering. You profit by owning a Gwin Aero,* Mighty Midget or Mighty Marine engine because their matchless efficiency is not approached by any other engine.

*Gwin Aero engine design embodies a full-length side exhaust integral with cylinder.



POWER PORTING AND PISTON RINGS DISTINGUISH NEW BUNCH MOTORS

All Bunch Engines full 1/5 h.p. at 5200 R.P.M.; 1/4 h.p. at 8500 R.P.M. Bore 7/16". Stroke 13/16". Bare weight 6 1/2 oz. Engines assembled and block-tested, or kits are complete with coil, condenser, fuel tank and Champion spark plug. Engine kits supplied with piston, piston rings and main bearing fitted ready to run. Also timer assembly set up.

<input type="checkbox"/> MIGHTY MIDGET Upright Assembled.....	\$ 9.50
<input type="checkbox"/> MIGHTY MIDGET Upright Kit.....	7.85
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<input type="checkbox"/> MIGHTY MIDGET Inverted Kit.....	7.85
<input type="checkbox"/> GWIN AERO Upright Assembled.....	12.00
<input type="checkbox"/> GWIN AERO Upright Kit.....	9.85
<input type="checkbox"/> GWIN AERO Inverted Assembled.....	12.50
<input type="checkbox"/> GWIN AERO Inverted Kit.....	9.85
<input type="checkbox"/> MIGHTY MARINE Assembled	12.50
<input type="checkbox"/> MIGHTY MARINE KIT	10.85

—Prices Postpaid

ORDER A BUNCH MOTOR TODAY!

Bunch Model Airplane Co.,
5009 So. Hoover St., Los Angeles, Calif.

Gentlemen:

I have selected and checked the above motor. Please deliver by return mail. Enclosed is postal money order.

Name.....

Street.....

City..... State.....

BUNCH MODEL AIRPLANE CO.

5013 SOUTH HOOVER STREET, LOS ANGELES, CALIFORNIA, U. S. A.

British Agents: Model Supply Stores, 17 Brasennose St., Manchester

FLY THE AIR CHIEF A RECORD BREAKER



\$6.00
Complete without Motor

61" wingspan, length 39"
weight 2 1/4 lbs. without motor

Equip with any standard miniature engine.
Kit includes—Wood cut to size, Pneumatic Air
Wheels, Formed Shock Absorbing Landing
Gear, Die cut Ribs, all needed Parts. Complete
without motor \$6.00.

U. S. S. HARTFORD



Historic Beautiful Complete
At last the flagship of Admiral Farragut
is yours to build. The kit for this 20'
model consists of Baltic birch 1/8" sheets
printed wood, cement, lacquer,
shellac, piano wire, cast metal anchor,
cast metal boats, steering
wheel, funnel tubing, dowels,
sandpaper, rigging thread/
beads, and full size plan.
\$1.00
Complete



CUTTY SARK

Carved wood hull printed balsa decks, Cast metal: life-
boats, anchor, bits, steering wheel, chains. Masts, spars,
rigging cement, colored lacquer, full size plans, instruc-
tions. COMPLETE

\$2.50

Complete Catalog 10c DEALERS



SHIP MODELS with MOULDED HULLS

TO RETAIL AT 10c AND 25c



Your name imprinted free on IDEAL'S famous
TRU-CUT KNIFE—the only all-purpose tool
for model building. It is held and operated the
same as a pen. It is especially designed for
cutting balsa wood, stencils, paper
patterns, and other objects re-
quiring accuracy of detail. At
last this greatly-in-demand item
may be purchased with YOUR
NAME IMPRINTED. Retail 10c
each. Write for full particulars.



IDEAL AEROPLANE & SUPPLY CO., Inc.

20-24 West 19th Street, New York

Pacific Coast Branch South Africa Distributor
Model Boat and Aircraft Company P.O. Von Brandis,
1386 8th Ave., San Diego, Calif. Johannesburg, S. A.

making the model. The paint job is silver with black trimmings and only small cans of dope or lacquer will be needed. The wheels or any other accessories may be purchased if desired.

Make the fuselage first. Draw the outline of the top view on a piece of balsa with the grain of the wood running lengthwise. Cut to shape with saw and sharp, flat chisel. Go over the surfaces roughly with coarse sandpaper and then draw on the side elevation. The fin will be put on later. Cut once more and then shape out the contour with your razor blade, as shown by the cross-sections.

Go over the surfaces with coarse and then fine sandpaper until maximum smoothness is obtained; and then begin the wing surfaces. They will be made in two panels, one for each side of the fuselage. Draw the plan view accurately on stock and cut to shape. Then taper them down as shown by airfoil sections and front elevation with a cold chisel and razor blade. Sandpaper the surfaces to smoothness and then make the tail surfaces in a like manner.

The propeller is to be made in four separate parts, namely the three blades and the hub. When they have been whitened out with your razor blade cement the blades to the hub with colorless model cement and lay aside to dry.

It is easier to make the landing gear legs in two separate parts. Shape out the two landing gear legs proper and then the part that extends outward to form the axle on separate pieces of wood. Then connect the two pieces with cement and when connections have dried thoroughly sandpaper to smoothness.

The assembly of the model is simple. Lay the fuselage in flying position and put the wing panels in place with plenty of model cement. Put blocks under the wing to hold it in place. Join the tail surfaces in place next. Take plenty of time and be accurate.

The next step is the landing gear which must be built sturdy. It might be well to use small pieces of wire as dowels. Go over all joints once more with cement and then sandpaper again. Brush off all dust and begin the paint job.

Many coats will have to be applied before a smooth finish is obtained. It might be well to go over the entire model with fine sandpaper after the first coat has dried. After a smooth finish has been obtained and the propeller has been painted silver, connect it to the nose with a straight pin as a prop shaft. Put the wheels on with wire inserted into the landing gear legs as axles. Any trimmings may be added that your skill will allow. You will then have a complete replica of the plane flown by Col. Roscoe Turner to win the 1938 Thompson Trophy Race, setting a new speed record for the event of 283 miles per hour.

What Do You Want to see
in this Magazine, fiction?

The Physics of the Airplane

(Continued from page 27)

The second Newtonian Law expostulates that whenever an acceleration is produced, a force must be applied. This law applies to an airplane engaging in curvilinear flight. We have shown how an airplane when it is flying in a circular path with a uniform airspeed exhibits an acceleration toward the center of the turn. The tendency of an object experiencing circular motion is to fly off in a direction which is tangential to the path of the circular motion. In order to prevent this, a force must be applied which acts at right angles (normal) to the direction of the circular motion. This force is the equivalent of the acceleration of the second Newtonian law. The force which holds the airplane on this circular path and which acts in toward the center of the turn is known as the "centripetal" force. The full magnitude of the centripetal force is equal to:

$$F = \frac{W \times A}{G}$$

F: Centripetal force

W: Weight

A: Acceleration

The acceleration in the case of a uniform circular motion is equal to:

$$4 \times (3.1416)^2 \times \text{Radius} \times (\text{R.P.S.})^2 \times \text{Wgt.}$$

32.2

The answer to this equation is the force that must be continuously exerted to keep the airplane moving in a circular path. Since this force must also have a reaction, the reaction is known as "centrifugal" force. The centrifugal force and the centripetal force are equal in magnitude but opposite in direction. See Figure 2. This shows the forces acting upon the airplane during a steep banked turn.

Periodic motions may be useful and yet dangerous in aeronautics. A simple example of periodic motion can be expressed by the degree of dihedral rigged into the wings of the high-winged monoplane. The disposition of the low center of gravity and a high center of lift make for stability on the lateral axis. If the wing is displaced, the center of gravity is also displaced.

(Continued on page 44)

FLASH! BURROWS SPECIAL WINS

2nd Annual Southeastern N.A.A. Gas Model Contest



Wing span 5 1/2', Chord 12", Flying weight 3 1/2 lbs.
Burrows Special flown by G. A. Burrows, took first
place in the Southeastern Contest, held at Charlotte,
N.C., Sept. 11, 1938.
Official time 2 minutes and 17 seconds, on a 30
second engine run.
G. A. Burrows took second place in this contest in
the fuel allowance event, with the same Burrows
Special.
Official time 4 minutes and 17 seconds on a gas al-
lowance of 4/16 ounce.

Burrows Special Kit complete (less motor, timer
or air wheels) \$5.50
Burrows Special Kit (less motor) with timer and
4 1/2" air wheels 7.50
Prices F.O.B. Charlotte, N.C.

We also handle all other popular makes of kits at ad-
vertised prices.

CHARLOTTE MODEL AIRCRAFT CO.
Professional Bldg. (Basement) Charlotte, N.C.

WORLD'S RECORD
30-second shut-off
Houston, Texas

TRENTON PETROLEERS MEET, Mercer Airport
Harold Johnson won R.J. Hughes Trophy... setting
new official N.A.A. Record of 6 Minutes 25 $\frac{1}{2}$ seconds

EASTERN STATES MEET
1st, 2nd, 3rd, 4th and 5th
places to Brown Model D

11th. ANNUAL NAT'L CHAMPIONSHIP
MODEL AIRPLANE MEET, Detroit
All major events won by Brown Motors

NEW YORK GAS MEET
1st and 2nd places

SOUTHERN CALIFORNIA GAS MODEL
MEET... 1st, 5th - 6th and 8th places

6 $\frac{1}{2}$. ANNUAL MISSISSIPPI VALLEY MEET
Winner of Performance event



Count these contest records ... and see why the Brown Motor is the only one for your model!

Noted above are just a few of the contest records recently made by Brown Junior Motors. Brown has so many victories to its credit that you can't fail to place it No. 1 on your wanted list. And—you can now buy this famous motor for less than the price of an ordinary motor kit! Get this incomparable power-plant for your model. Get set for your own contest records—and for more thrills than you've ever known before! Junior Motors authorized dealers, equipped to give you expert service and advice, are located in every section of the country.

MAKE YOUR MOTOR RUN BETTER WITH THIS NEW SPARK PLUG

Engineered specially for model motors. High-tension dielectric heat resisting core. Special thermo-controlled center electrode. Concentrated, powerful spark for easy starting. Leak-proof for perfect performance and long life. Make your model motor run better. Change to the J-M Spark Plug today. 65c each.



Other Brown Junior Motors include these outstanding performers:

MODEL B: Special steel cylinder and steel piston retain compression and power. Chrome-molybdenum crank-shaft, practically shock-proof. \$21.50 complete. MODEL C: Light weight combined with durability at the medium price of \$17.00 complete. MODEL M (MARINE): With the speed and stamina characteristic of Brown motors for model planes. \$15.00 complete.



BROWN JUNIOR MOTOR

MODEL D

complete with coil and condenser—ready to fly—only

\$10

MODEL D SPECIFICATIONS

Bore, $\frac{3}{8}$ ". Stroke, 1". Weight (bare) 6 $\frac{1}{2}$ oz. $\frac{3}{8}$ h.p.
R.P.M. 1200 to 10,000. Height 4 $\frac{1}{4}$ " (including spark plug). "Z" metal counterbalanced crank-shaft. Connecting rod of forged aluminum alloy.

Block-tested before shipping and guaranteed against defective workmanship or materials.

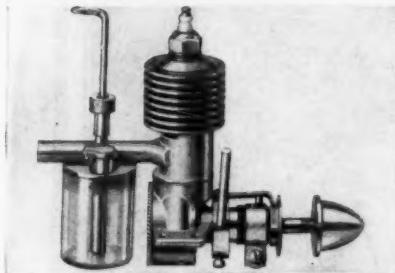


JUNIOR MOTORS CORPORATION
2545 N. BROAD STREET, PHILADELPHIA, PA.

Brown JUNIOR MOTORS

SCIENTIFIC

BRAT THE ORIGINAL
LIGHT CLASS MOTOR



The POWER PLANT for Champions

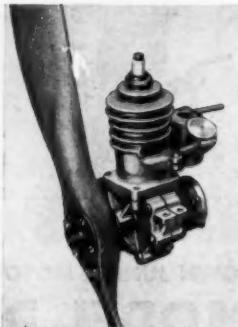
THE 1939 MODEL BRAT is the most complete motor of its size. All parts are precision made, .001" bore, and completely interchangeable. THE BRAT IS TOP'S for appearance, performance, power and dependability and is one of the easiest motors to start. With such features as transparent and unbreakable gas tank, strong aluminum crank case, foolproof and adjustable spark system, etc., the Brat is one of the lightest weight motors for its size on the market. Specifications: Bore 9/16" Stroke 5/8" Overall height 3 1/2". Weight 3 1/4 oz. Flying weight 8 oz. (including batteries). Speed 3500 to 7500. Shipped Complete with coil, condenser, plug, correct design propeller, instruction manual and can of S.A.E. 70 oil.

PRICE \$16.50 POSTPAID

DO NOT be confused by motors with similar sounding names, remember the original light class motor is spelled

B-R-A-T

BRAT MOTOR KIT—all parts precision made. Easy to assemble in one hour. \$12.50 P.P. This makes an ideal combination when used with the Eagle gas model. Complete kit for motor and airplane only \$30.00 postpaid.



THE ELF AIRCRAFT ENGINE

A Gasoline Engine For Small Model Airplanes. Guaranteed Performance

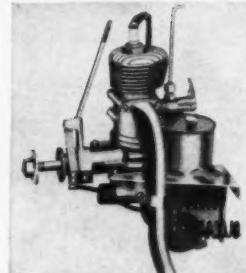
The ELF starts easily and quickly under all conditions on two fountain pen flashlight cells. (Buster batteries are never used.) The ELF runs more than 45 minutes on one ounce of fuel with the standard propeller turning at 3500 rpm. A three ounce bottle holds enough fuel for a day's flying. Runs smoothly and steadily without misfiring, sputtering, or speed fluctuations at all speeds. Speed is controlled by advancing and retarding the spark, making it possible to test fly models safely by slowing the engine. If your engine fails in any of these four points it will be repaired or replaced free of charge.

The ELF is further guaranteed against defective material or workmanship. Any such faults will be repaired free of charge.

CONSTRUCTION DETAILS

The cylinder and crankcase are sand cast of aluminum, the cylinder fitted with a thin steel liner. The timer is automobile type, completely enclosed, with contactless points having a cam plate. The spark plug weighs 1/10 ounce and has a 3/16" thread. INVERTING—The ELF does not flood or foul its plug in the inverted position. ELF model weighs from 12 to 20 ounces including the complete power plant. Wing span of 3 to 5 feet. Bore 9/16" Stroke 19/32 inches Displacement 0.128 cubic inches Wt. of bare engine 4 oz. Complete with batteries, fuel, propeller, etc., only 8 oz. Engine sold complete, including coil, condenser, fuel tank, propeller and may be had in either upright \$21.50 or inverted position. Postpaid

1939 AIRSTREAM DENNYMITE



5/8" bore — light weight — 500 to 1200 R.P.M.

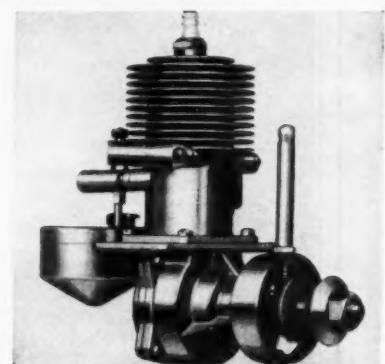
DELUXE Standard on the DeLuxe Airstream are aluminum outside exhaust, dual mounts, superior coil, and outside-control \$17.50

STANDARD Includes hot-spark coil and condenser. Does not include DeLuxe mounting brackets, spring choke, down \$15.50

UNIT This economical motor is identical to the higher priced standard model except that coil and condenser are not included \$13.50

SPECIAL BUY

DENNYMITE powerplant: standard round cylinder head engine at this new low price. Tremendously powerful, especially for its size, due to its design. Packed complete, ready to fly, with dual mounts. Factory tested, adjusted, guar \$14.50



FORSTER "HERCULES" THE MOTOR OF CHAMPIONS

To come out on top, to win contests, you must look for good design, dependability and general quality in the motor of your choice. Bore 1 1/16", stroke 1 1/8", H.P. 1/2, weight 14 oz. (not including flywheel).

OUTSTANDING FEATURES OF THIS MODERN MOTOR

Ball Bearing Crankshaft, Automotive Type Timer, Most Efficient Spark Coil, Improved Carburetor, New "Low Head" Gas Tank, Most Powerful Motor in Class, Only Light Weight Motor Per Horsepower, Equipped With Two Precision Rings, Light Weight Alloy Frame, Lynite Connecting Rod, Removable Bearings.

It is well to bear in mind that the power of the FORSTER motor is 1/2 H.P. at 3500 R.P.M. with a 10" dia. 16 pitch propeller. The bare weight of the motor is 14 ounces. The flying weight, complete with coil, condenser, tank and battery, 23 ounces. The bare weight with propeller is 14.5 H.P. thus small motor.

Accordingly, a plane powered with a FORSTER motor will weigh between 4 and 5 ounces above that of smaller motors which, when proportioned, cost twice as much. The FORSTER motor is truly a LITTLE HERCULES.

All parts are assembled, tested, and run at the factory. Model "B" Air cooled, complete with spark coil and condenser, spark plug, and gas tank, with side bug mounting or rear bug mounting. Same as above but with Ball Bearing Main Bearing.

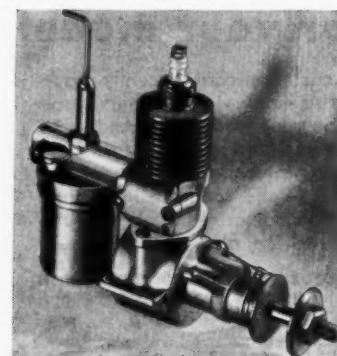
Model "C" Air or Water Cooled. Complete with Coil, Condenser, Spark Plug and Gas Tank. (Not including Flywheel).

The Same with Ball Bearing.

Finished and balanced Flywheel, 35" Dia. especially for FORSTER BROTHERS Motors.

A Motor speed.
lb. max.
its bl.
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NEW PEE-WEE 1939 SMALL BORE MOTOR

An Amazing New Midget Motor

- Lightweight
- Compact Size
- Speed
- Power
- Easy Starting
- Dependable

SPECIFICATIONS

Bore 5/8". Stroke: 9/16". Height: Overall 3 1/4". Length: Overall 8 to 12 inches. Weight: 14 oz. of fuel. Cylinder: Cast iron, with 11 fins for efficient cooling at all speeds. Piston lapped and machined to .0001". Crankshaft: Machined from tool steel. Main Bearing: Oilite Oil Cushion, bronze. Connecting Rod: Special durable alloy, die cast. Wrist Pin: Steel. Carburetor: Die cast aluminum. Fuel type: mixed. Fuel Capacity: 1/4 oz. Fuel Plug: Standard. Thread: 1/4"-32 SAE thread. Battery: Operates with 2 Penlite batteries. Timer: Fully adjustable for accurate speed control. Tungsten points. Operation: Operates upright or inverted. (Includes Coil and Condenser and Prop. and Prop.)

\$14.50 Postpaid

Assembled, Tested,
Guaranteed

M & M's NEW 1939 MODEL HIGH-POWERED SMALL BORE MOTOR

for POWER, STAMINA and
LONG ENDURING PERFORMANCE

M & M Products Are Built for Quality and Performance and Not To Meet Competitive Prices

SPECIFICATIONS

Bore 21/32", Stroke 2 1/2", Weight 14 oz. Bare Motor 3 1/4" ounces Total Weight Motor, Coil, Gas, 7 1/2" inches. Ready to Run—Less Prop. Speed Range 500 to 12,000 R.P.M. With 1/2" dia. 16 pitch propeller. 100% POWER. CYLINDER AND PISTON—Machined from solid stock of special cast iron to .0001". IGNITION—Fool-proof set of points with a SPECIAL VOLTAGE ADJUSTMENT. COIL—12 volt, 10000 ohms, 1/2" dia. 1/2" vol. spark coil. Designed to operate on two pen-cells. These coils are OIL-PROOF, WATER-PROOF, and SHOCK-PROOF. MOUNTING OPENS AND CLOSES EASILY. MOTOR CAN BE OPERATED UPRIGHT OR INVERTED. All M & M motors are assembled and block tested at the factory before shipment. All M & M motors are sold only as completely assembled units.

\$17.50 POSTPAID

FREE WITH PURCHASE OF ANY MOTOR. INSTRUCTION MANUAL ON CARE AND OPERATION OF YOUR MOTOR; ALSO SCIENTIFIC'S IRONCLAD DOUBLE GUARANTEE ON EVERY MOTOR PURCHASED. COIL AND CONDENSER ARE ALSO INCLUDED (WITH EXCEPTION OF DENNYMITE UNIT).

SCIENTIFIC MODEL AIRPLANE COMPANY

216-226 MA-12 Market Street

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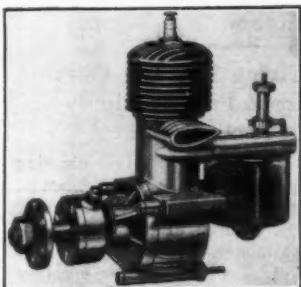
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SCIENTIFIC

OHLSSON Model
"23"
SMALL BORE ENGINE



A rugged baby brother of the famous Ohlsson Gold Seal Motor—only 3-9/16" high, but packed with more power, speed, and stamina than any other motor for its size on the market. The Ohlsson "23" has plenty of power to fly a 3 lb. model, yet it is small enough to fly a 20 oz. job—in other words, it is the perfect "23" for every small job. Like its big brother, the Ohlsson "23" is built from the finest materials money can buy, and is assembled and tested under the rigid supervision of the same men who have made Ohlsson motors first choice with model fans the world over.

Compare the Ohlsson "23" part by part with any other motor of comparable size on the market—and we'll let you be the judge!

SPECIFICATIONS

Horse power 1/7; Stroke 3/8"; Bore 5/8"; Bare engine weight only 4 1/2 ounces; Height 3-9/16". Mounting—combination radial or lug. Dural I-Beam connecting rod. Bronze Bearings. Carburetor—special needle type mixing valve. Crankshaft—1/4" machined from solid stock. Timer—fully enclosed, adjustable. Spark Ignition coil. Spark plug—Champion V-2. Gas tank—special clear transparent composition. The fact that all parts are completely interchangeable makes replacement easy and economical. Ohlsson motors operate upright or inverted. Order your Ohlsson "23" engine now for immediate delivery. Complete with coil, condenser, fuel tank and Champion spark plug.

Pretested and Fully Guaranteed

\$16.50

POSTPAID
Scientific Double
Guarantee.

New BUNCH "39" MOTORS

Climaxing months of intensive experimental work, BUNCH engineers announce they have packed still more power into their already noted Model "39" Gwin-Aero Mighty-Midget and Mighty Marine engines. The Model "39" engines are not "revised downward" and cheapened to promote sales. The new engines are offered at a price made possible only by more efficient, highly developed production methods.

The Model Motors With Modern Aircraft Features CHECK THESE EXCLUSIVE FEATURES

One-piece modern Aircraft Cylinder:

Micro-Metal Machine Cast Crankcase:
Precision Lubrication through Oil Drilled Crankshaft: New Reversible "Marcel Locking" Timer System: Micrometer Type, Spring-Locked Needle Valve: "Square Section" Piston Rings and Hi-Dome Piston: Specifications: All Bunch Engines full 1/2 h.p., 5200 r.p.m.; 1/4 h.p., 8500 r.p.m. Bore 7/8", Stroke 13/16", Bare Weight 6 1/2 oz. Complete, ready to run, with coil, condenser, fuel tank and Champion spark plug.

MIGHTY-MIDGET Upright Assembled... \$9.50

MIGHTY-MIDGET Inverted Assembled... 7.75

MIGHTY-MIDGET Upright Assembled... 7.75

GWIN-AERO Upright Kit... 12.00

GWIN-AERO Inverted Kit... 9.95

GWIN-AERO Upright Assembled... 10.00

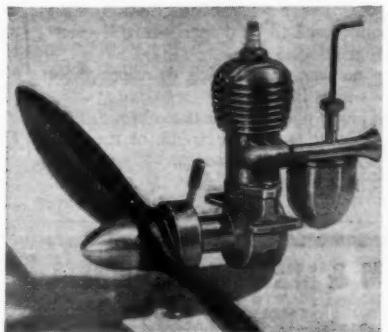
GWIN-AERO Inverted Kit... 8.85

MIGHTY MARINE Assembled... 12.50

MIGHTY MARINE Upright Assembled... 10.85

All prices are postpaid.

FREE correct design propeller, S.A.E. 70 oil, and instruction manual and Scientific Double Guarantee.



BANTAM MINIATURE MOTOR

The BANTAM motor is the result of years of painstaking research. A watchful eye has been kept upon achieving maximum horsepower, balance and rugged construction which will insure long life.

The Bantam engine boasts many advanced structural features:

- Heat treated alloy crankcase
- One-piece chrome vanadium steel crankshaft
- Chrome molybdenum cylinder liner
- Tapered shaped piston rings
- Nickel aluminum alloy piston
- Efficient cooling
- Efficient carburation

SPECIFICATIONS

Bore 19/32", Stroke 19/32", Bare engine weight 2 1/2 oz. Speed range—500 to 8000 R.P.M. Gas tank removable for cleaning. Capacity 5/8 oz. Semi-inclosed and adjustable timer. Spark Plug—1/4 x 32 V-12 Champion.

PRICE \$16.50 POSTPAID

FREE correct design propeller, S.A.E. 70 oil, instruction manual and Scientific Double Guarantee.

OHLSSON GOLD SEAL MOTOR

H.P. 1/2. Bore 5/8". Stroke 15/16". 500 to 10,000 R.P.M. Bare Wt. 8 ozs.

Ohlsson Gold Seal miniature motors are built to give that extra margin of performance between an ordinary motor and a champion! The combination of the finest raw materials plus the most skilled engineering in the industry produces that Ohlsson equalled and never exceeded. Every Ohlsson Motor is a Champion from the first turn of the prop—that's why model builders everywhere enthusiastically endorse Ohlsson. Order yours today! Complete, including Coil, Condenser, Oil and Double Guarantee.

Only **\$18.50 POSTPAID**

FREE correct design propeller, S.A.E. 70 oil, instruction manual and Scientific Double Guarantee.

SCIENTIFIC MODEL AIRPLANE COMPANY

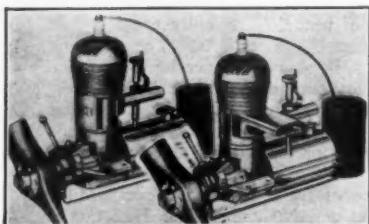
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Always Stocks 1000 Motors

For Immediate Delivery



THE NEW SYNCRO ACE

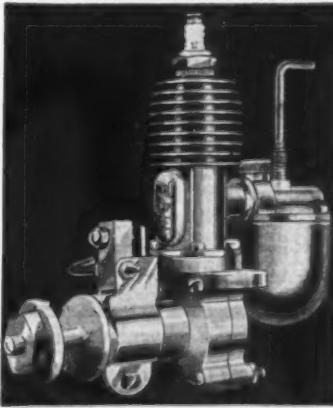
The new SYNCRO ACE—the popular priced streamlined miniature gasoline engine for model aircraft and boats—is equipped with new high efficiency coil, oilite bearings, and the new specially designed CHAMPION Spark Plug.

GENERAL SPECIFICATIONS

Horsepower—approximate 1/4. Engine Displ... 3/4 cu. in. Stroke—15/16". Motor Speed—800 to 8000 R.P.M. Cylinder—Machined steel to within .0001". Piston—Special machined steel alloy. Connecting Rod—Cast of special aluminum alloy. Crankshaft—Counterbalanced, machined from special accuracy stock. Timer—Improved steel and fiber timer placed conveniently above oil and grime interference. Ignition Coil—Light weight, high efficiency, developed by Delco-Remy Corporation. Spark Plugs—New Champion, Standard 3/8". PARTS ALL INTERCHANGEABLE, except piston and cylinder which are machined and lapped together. ELECTRIC ENGINE FACTORY TESTED, MOUNTED ON SKIDS AND SOLD READY TO RUN, complete with coil, condenser, fuel tank, etc.

PRICE \$13.75 POSTPAID

FREE, correct design propeller, S.A.E. 70 oil, instruction manual and Scientific Double Guarantee with all Syncro Motors.



THE NEW SYNCRO BEE

The new SYNCRO BEE—the smallest practical model gasoline engine ever put into production—the ideal power plant for those tiny new planes. Design has been so planned that the advantages of quantity production methods enable us to pass along this saving to you. Equipped with the new Syncro light-weight specially designed high efficiency coil, Oilite bearings, new Champion V-2 Spark Plug.

GENERAL SPECIFICATIONS:

Horsepower—Approximate 1/4. Engine Weight complete—321 oz. Bore—5/8". Stroke—5/8". Motor Speed—1000 to 8000 R.P.M. Cylinder—Special machined steel. Piston—Special Aluminum Alloy with 2 rings. Connecting Rod—Cast of special aluminum alloy. Crankshaft—Precision machined from specially treated steel stock. Timer—Steel and fiber construction placed conveniently above oil and grime interference as used on the famous Syncro Ace. Ignition Coil—Syncro's new "SUPER-LITE"—weight 1 1/2 oz., specially developed for the SYNCRO BEE. Spark Plug—New Champion (V-2) 3/8". VERTICAL OR INVERTED. PARTS ALL INTERCHANGEABLE. ELECTRIC ENGINE FACTORY TESTED.

PRICE \$12.50 POSTPAID

NEW HUSKY MOTOR

**\$12.50
POSTPAID**

5/8" bore 5/8" stroke, wt. 1 lb. 12 oz. Each motor is thoroughly tested, run in, and carries the famous Scientific Double Guarantee. Complete with coil, condenser, propeller, and can of SAE 70 oil. Order from Scientific today.

DEALERS WHOLESALE CLUBS

Now is the time to stock up for the Christmas Holidays with QUALITY Supplies at ROCK BOTTOM PRICES.

CLEAR CEMENT	COLORED DOPE	ALUMINUM TUBING
Strong Non-Blushing	Red, Yellow, Orange, White, 1 lb. Blister	1/16" O.D., 5/32" I.D., 5/32" O.D., 5/16" I.D.
1 oz., doz.38	1/16" O.D., 5/32" I.D., 5/32" O.D., 5/16" I.D.
2 oz., doz.35	1/16" O.D., 5/32" I.D., 5/32" O.D., 5/16" I.D.
Pint 1.50	1.50	1/16" O.D., 5/32" I.D., 5/32" O.D., 5/16" I.D.
5 Gallons 5.75	5.75	1/16" O.D., 5/32" I.D., 5/32" O.D., 5/16" I.D.

CLEAR DOPE	DRAG RINGS - COWLS
Fast Drying, Non-Smoking	Open Face Closed-Face
1 oz., doz.35	1 1/2" " 3 for .22
2 oz., doz.55	2 1/2" " 3 for .35
Pint 1.25	3 1/2" " 3 for .40
Gallon 1.75	3" " 3 for .45
5 Gallons 2.25	

JAP. "AAA" TIS-SUE	BROWN RUBBER
White, doz.11	1/4" Skin 1/4" for .25
Yellow, doz.11	1/4" Skin 1/4" for .25
Black, doz.11	1/4" Skin 1/4" for .25
Gray, doz.11	1/4" Skin 1/4" for .25
Blue, doz.11	1/4" Skin 1/4" for .25
Pink, doz.11	1/4" Skin 1/4" for .25
Gallon 1.25	1/4" Skin 1/4" for .25
5 Gallons 2.50	1/4" Skin 1/4" for .25

PAUL-O-WINA PROPS	WHEELS (DOZ.)
5" doz.30	1/2" 10 for .20
6" doz.35	1/2" 10 for .20
7" doz.45	1/2" 10 for .20
8" doz.60	1/2" 10 for .20
9" doz.75	1/2" 10 for .20
10" doz.90	1/2" 10 for .20
12" doz. 1.40	1/2" 10 for .20
15" doz. 2.50	1/2" 10 for .20

RUBBER LUBRICANT	STEELE WIRE
1 oz., doz.75	1/16" 10 for .20
2 oz., doz.90	1/16" 10 for .20
3 oz., doz. 1.00	1/16" 10 for .20
4 oz., doz. 1.25	1/16" 10 for .20
5 oz., doz. 1.50	1/16" 10 for .20
6 oz., doz. 1.75	1/16" 10 for .20
7 oz., doz. 2.00	1/16" 10 for .20
8 oz., doz. 2.25	1/16" 10 for .20
9 oz., doz. 2.50	1/16" 10 for .20
10 oz., doz. 2.75	1/16" 10 for .20
12 oz., doz. 3.00	1/16" 10 for .20
15 oz., doz. 3.50	1/16" 10 for .20

Send on letterhead for additional prices.

ORDERING INSTRUCTIONS: All Orders shipped Express Charge Collected. No Orders less than \$1.00 on C.O.D., send 25% with order. Remittance by Postal or Express Money Order Only.

TRIANGLE MODEL SUPPLY CO.
32-57 38th St. Dept. MA-1 Long Island City, N.Y.

AVIATION-RADIO
LET RADIO BE YOUR STEPPING STONE TO A CAREER IN AVIATION

Our radio telephone third class license manual qualifies you for government license as radio operator in aviation, aeronautical, police and mobile radio telephone stations. No code required. One dollar postpaid.

INLAND WIRELESS, 1234 S. Wabash, Chicago

MODELER'S KNIFE

The above knife has 8 razor sharp blades made of Swedish tempered and polished spring steel. Sawblade for model work. Comes in a handy box with metal holder for the blades all fit to the same handle. (The ideal gift for all modelmakers.) 94¢ in U. S. Foreign 14¢ extra. We have 14 styles of blades for arts & crafts, schools, students and sportsmen. A well-made knife. The blades do not break.

NILS SEAHOLM 139 Kingsbridge Rd., Dept. MA Mt. Vernon, N. Y.

WHY M & M's HIGH-POWERED Small Bore Motor Is Creating A Sensation!

More Power! Easy To Start! Special New Features! SPECIFICATIONS

Bores 21/32" Stroke 22/32"

Weight of Bare Motor 3 1/2 ounces

Total Weight, Motor, Coil, Gear, 7 1/2 ounces

Ready to Run—Less Prop.

Speed Range 5000 to 12,000 R. P. M.

With 1/2" & 1" speed controlled prop.

STATIC THRUST 20 OUNCES

ONLY \$17.50 Postpaid

Without Exhaust Stack, Exhaust Stack \$1.00 extra. Postpaid.

Complete and ready to run.

POSTPAID TO ALL FOREIGN COUNTRIES

M & M Special Designed Prop. \$1.00 Extra Postpaid.

M & M Special 2-4 volt coil designed to operate M & M motors

on 2 pen-cells. Will

also operate all

larger motors more

efficiently. Price

\$3.00 postpaid.

Obtain M & M Products from any Progressive Dealer or Send to Us

We Also Distribute Brown Jr. Motors

PRICES—\$10.00—\$17.00—\$21.50

Postpaid — Complete Ready-to-Run

(Continued from page 40)

This displacement is proportional to the original displacement. The center of gravity tends to assume its normal position, and in doing this function, the wings may oscillate back and forth through a limited period of amplitude; until the fullest of the pendulous stability is satisfied. Good examples of pendulous stability are found in conventional gas models. The righting tendency is simply an acceleration which is proportional to the displacement.

Another example of periodic motions which are dangerous are the phugoid oscillations or oscillations along the longitudinal axis. These oscillations are an evidence of instability and are caused by incorrect aerodynamic design. Buffeting is another source of dangerous longitudinal oscillations which may be cured by the correct application of expanding fillets on the wing roots. Wing flutter is also classed as a series of harmful structural vibrations or motions. It is structurally dangerous and is a result of the lack of rigidity in torsion in the plane of the drag truss of the wing.

Periodic motion is defined as the range or amplitude of motion that objects assume as a result of some application of external force. The amplitude of the motion is determined by the resistance which the body offers to displacement and the displacing force. The motion is damped out in a manner which is logarithmic proportional to the resistance. The range of motion is limited to an extreme point at which it comes to rest momentarily, before it oscillates in the other direction. If the motion is constant it is classified as a "periodic motion."

If the motion is less and less during each complete degree of oscillation, then it is considered to be damped or will eventually cease.

The nomenclature which describes these motions is as follows:

The amplitude is the distance between the neutral point and the extreme of the path over which the body moves.

The period of oscillation is equivalent to the time consumed during the complete

oscillation.

The frequency is the number of complete oscillations which are made in a specific time. Frequency is the reciprocal of time.

Aircraft instruments have many uses of periodic motions. We find the use of such motions as governors in tachometers, or turbine wheels which are air-driven and known as gyroscope wheels and used in turn as indicators and directional gyros. To the aeronautic analyst, the study of circular motions will permit a complete unraveling of the subject of forces and accelerations in turns.

The Flying Box Car Goes Around the World

(Continued from page 11)

number of ships simply by constructing all the ships to fit the mount. Then if something goes wrong with the ship the engine can be changed to another plane in two or three minutes time.

The airfoil of this ship was specially designed by Mr. Charles Grant to give the ship a slow speed and high lift, which practically eliminates the danger of damage due to a high speed crash. It used to be that a model builder had a fair chance of keeping up with a gas model like the KG; but now with the small high speed ships it takes three motorcycles and an airplane to try to keep it in sight, the speed of models having increased beyond the capacity of the model builder's legs. Many builders will appreciate a slow-flying model when it is necessary to run cross-country through weeded fields and woods after it. When landing, a model like the KG has a good chance to make a three-point landing (conventional) due to its slower landing speed. With the smaller ships, having much faster landing speeds it is generally necessary when landing to utter an "Oh"—and the remark about how good that prop was.

They said "it couldn't be done" when the author stated his intentions of flying a 6-1/4 pound KG of ten foot span with a one-sixth horsepower Cyclone fanning the fuselage. However it not only flew well, but at the 1936 Nationals it made an official flight of over twenty minutes and proved to be the slowest and most stable model at the meet. An engine of one-fifth horsepower will give much better performance, but an engine of one-third horsepower is recommended for real performance.

The performance of this ship speaks for itself. It started its long line of record flights at the Eastern States contest in 1934 by placing second in that event, and later in the summer it also placed second in the Nationals. That was only a start however, for in the Spring of 1935 at the Eastern States contest it made a new world's record of one hour, four minutes and forty seconds! The fact that this ship, designed back in 1933, made a world's record which was not surpassed until the summer of 1937—and then only by a few minutes—speaks very well for its performance, considering the many improvements in design which have been made since.

The fact that the "Flying Box Car" is not only popular from Maine to California, but also in all parts of the world, gives reason

M & M's NEW 2 5/8" WHEEL

Designed for SMALL GAS MODELS

Can be Inflated and Deflated. Weight, 1 ounce per pair



Per Pair—

Postpaid

Add 17¢

For Air Mail Add 21¢

M & M's FOR LARGER GAS MODELS

3 1/2" & 4 1/2" Gas wheels—weight 2 1/2 and 3 oz.

per pair.

Now only \$2.75 per pair, postpaid.

Size 6 1/2" & 8" Gas wheels—weight 3 1/2 & 4 1/2 oz. per pair p.p.

M & M Super Heavy Duty Wheel for Rubber Powered Models.

SIZES 1 1/4—1 3/4—1 1/2—2 1/2—2 3/4—3 1/2—4 1/2—5 1/2—6 1/2—7 1/2—8 1/2—9 1/2—10 1/2—11 1/2—12 1/2—13 1/2—14 1/2—15 1/2—16 1/2—17 1/2—18 1/2—19 1/2—20 1/2—21 1/2—22 1/2—23 1/2—24 1/2—25 1/2—26 1/2—27 1/2—28 1/2—29 1/2—30 1/2—31 1/2—32 1/2—33 1/2—34 1/2—35 1/2—36 1/2—37 1/2—38 1/2—39 1/2—40 1/2—41 1/2—42 1/2—43 1/2—44 1/2—45 1/2—46 1/2—47 1/2—48 1/2—49 1/2—50 1/2—51 1/2—52 1/2—53 1/2—54 1/2—55 1/2—56 1/2—57 1/2—58 1/2—59 1/2—60 1/2—61 1/2—62 1/2—63 1/2—64 1/2—65 1/2—66 1/2—67 1/2—68 1/2—69 1/2—70 1/2—71 1/2—72 1/2—73 1/2—74 1/2—75 1/2—76 1/2—77 1/2—78 1/2—79 1/2—80 1/2—81 1/2—82 1/2—83 1/2—84 1/2—85 1/2—86 1/2—87 1/2—88 1/2—89 1/2—90 1/2—91 1/2—92 1/2—93 1/2—94 1/2—95 1/2—96 1/2—97 1/2—98 1/2—99 1/2—100 1/2—101 1/2—102 1/2—103 1/2—104 1/2—105 1/2—106 1/2—107 1/2—108 1/2—109 1/2—110 1/2—111 1/2—112 1/2—113 1/2—114 1/2—115 1/2—116 1/2—117 1/2—118 1/2—119 1/2—120 1/2—121 1/2—122 1/2—123 1/2—124 1/2—125 1/2—126 1/2—127 1/2—128 1/2—129 1/2—130 1/2—131 1/2—132 1/2—133 1/2—134 1/2—135 1/2—136 1/2—137 1/2—138 1/2—139 1/2—140 1/2—141 1/2—142 1/2—143 1/2—144 1/2—145 1/2—146 1/2—147 1/2—148 1/2—149 1/2—150 1/2—151 1/2—152 1/2—153 1/2—154 1/2—155 1/2—156 1/2—157 1/2—158 1/2—159 1/2—160 1/2—161 1/2—162 1/2—163 1/2—164 1/2—165 1/2—166 1/2—167 1/2—168 1/2—169 1/2—170 1/2—171 1/2—172 1/2—173 1/2—174 1/2—175 1/2—176 1/2—177 1/2—178 1/2—179 1/2—180 1/2—181 1/2—182 1/2—183 1/2—184 1/2—185 1/2—186 1/2—187 1/2—188 1/2—189 1/2—190 1/2—191 1/2—192 1/2—193 1/2—194 1/2—195 1/2—196 1/2—197 1/2—198 1/2—199 1/2—200 1/2—201 1/2—202 1/2—203 1/2—204 1/2—205 1/2—206 1/2—207 1/2—208 1/2—209 1/2—210 1/2—211 1/2—212 1/2—213 1/2—214 1/2—215 1/2—216 1/2—217 1/2—218 1/2—219 1/2—220 1/2—221 1/2—222 1/2—223 1/2—224 1/2—225 1/2—226 1/2—227 1/2—228 1/2—229 1/2—230 1/2—231 1/2—232 1/2—233 1/2—234 1/2—235 1/2—236 1/2—237 1/2—238 1/2—239 1/2—240 1/2—241 1/2—242 1/2—243 1/2—244 1/2—245 1/2—246 1/2—247 1/2—248 1/2—249 1/2—250 1/2—251 1/2—252 1/2—253 1/2—254 1/2—255 1/2—256 1/2—257 1/2—258 1/2—259 1/2—260 1/2—261 1/2—262 1/2—263 1/2—264 1/2—265 1/2—266 1/2—267 1/2—268 1/2—269 1/2—270 1/2—271 1/2—272 1/2—273 1/2—274 1/2—275 1/2—276 1/2—277 1/2—278 1/2—279 1/2—280 1/2—281 1/2—282 1/2—283 1/2—284 1/2—285 1/2—286 1/2—287 1/2—288 1/2—289 1/2—290 1/2—291 1/2—292 1/2—293 1/2—294 1/2—295 1/2—296 1/2—297 1/2—298 1/2—299 1/2—300 1/2—301 1/2—302 1/2—303 1/2—304 1/2—305 1/2—306 1/2—307 1/2—308 1/2—309 1/2—310 1/2—311 1/2—312 1/2—313 1/2—314 1/2—315 1/2—316 1/2—317 1/2—318 1/2—319 1/2—320 1/2—321 1/2—322 1/2—323 1/2—324 1/2—325 1/2—326 1/2—327 1/2—328 1/2—329 1/2—330 1/2—331 1/2—332 1/2—333 1/2—334 1/2—335 1/2—336 1/2—337 1/2—338 1/2—339 1/2—340 1/2—341 1/2—342 1/2—343 1/2—344 1/2—345 1/2—346 1/2—347 1/2—348 1/2—349 1/2—350 1/2—351 1/2—352 1/2—353 1/2—354 1/2—355 1/2—356 1/2—357 1/2—358 1/2—359 1/2—360 1/2—361 1/2—362 1/2—363 1/2—364 1/2—365 1/2—366 1/2—367 1/2—368 1/2—369 1/2—370 1/2—371 1/2—372 1/2—373 1/2—374 1/2—375 1/2—376 1/2—377 1/2—378 1/2—379 1/2—380 1/2—381 1/2—382 1/2—383 1/2—384 1/2—385 1/2—386 1/2—387 1/2—388 1/2—389 1/2—390 1/2—391 1/2—392 1/2—393 1/2—394 1/2—395 1/2—396 1/2—397 1/2—398 1/2—399 1/2—400 1/2—401 1/2—402 1/2—403 1/2—404 1/2—405 1/2—406 1/2—407 1/2—408 1/2—409 1/2—410 1/2—411 1/2—412 1/2—413 1/2—414 1/2—415 1/2—416 1/2—417 1/2—418 1/2—419 1/2—420 1/2—421 1/2—422 1/2—423 1/2—424 1/2—425 1/2—426 1/2—427 1/2—428 1/2—429 1/2—430 1/2—431 1/2—432 1/2—433 1/2—434 1/2—435 1/2—436 1/2—437 1/2—438 1/2—439 1/2—440 1/2—441 1/2—442 1/2—443 1/2—444 1/2—445 1/2—446 1/2—447 1/2—448 1/2—449 1/2—450 1/2—451 1/2—452 1/2—453 1/2—454 1/2—455 1/2—456 1/2—457 1/2—458 1/2—459 1/2—460 1/2—461 1/2—462 1/2—463 1/2—464 1/2—465 1/2—466 1/2—467 1/2—468 1/2—469 1/2—470 1/2—471 1/2—472 1/2—473 1/2—474 1/2—475 1/2—476 1/2—477 1/2—478 1/2—479 1/2—480 1/2—481 1/2—482 1/2—483 1/2—484 1/2—485 1/2—486 1/2—487 1/2—488 1/2—489 1/2—490 1/2—491 1/2—492 1/2—493 1/2—494 1/2—495 1/2—496 1/2—497 1/2—498 1/2—499 1/2—500 1/2—501 1/2—502 1/2—503 1/2—504 1/2—505 1/2—506 1/2—507 1/2—508 1/2—509 1/2—510 1/2—511 1/2—512 1/2—513 1/2—514 1/2—515 1/2—516 1/2—517 1/2—518 1/2—519 1/2—520 1/2—521 1/2—522 1/2—523 1/2—524 1/2—525 1/2—526 1/2—527 1/2—528 1/2—529 1/2—530 1/2—531 1/2—532 1/2—533 1/2—534 1/2—535 1/2—536 1/2—537 1/2—538 1/2—539 1/2—540 1/2—541 1/2—542 1/2—543 1/2—544 1/2—545 1/2—546 1/2—547 1/2—548 1/2—549 1/2—550 1/2—551 1/2—552 1/2—553 1/2—554 1/2—555 1/2—556 1/2—557 1/2—558 1/2—559 1/2—560 1/2—561 1/2—562 1/2—563 1/2—564 1/2—565 1/2—566 1/2—567 1/2—568 1/2—569 1/2—570 1/2—571 1/2—572 1/2—573 1/2—574 1/2—575 1/2—576 1/2—577 1/2—578 1/2—579 1/2—580 1/2—581 1/2—582 1/2—583 1/2—584 1/2—585 1/2—586 1/2—587 1/2—588 1/2—589 1/2—590 1/2—591 1/2—592 1/2—593 1/2—594 1/2—595 1/2—596 1/2—597 1/2—598 1/2—599



The Gas Model Bargain of the Year!

CLEVELAND CLOUDSTER

Sensational in Design—Value—and Performance

(Dry kits mean no cements or dopes included)

THE KIT:

Includes adjustable wings and stabilizer; name plate for the fin, with space for your name and address in case the model is lost, incorporated right within the design. Span of 50", length 31". Kit contains all necessary balsa, everything needed printed out, with full size C-D drawings, celluloid, leading edge, music wire, nuts, bolts, washers, etc., absolutely everything except the cements, dopes, wheels and power unit with propeller.



Ideally Suited to Radio-Control Work For Which Purpose It's Most Popular in U.S.

These two really authentic gas models are standouts wherever gas models are shown or flown. Prize winners in contest after contest—on flights and looks! Each is packed with authentic, easily made detail. STINSON RELIANT—Dry Kit GP-66, postfree, only \$8.50 (42" span). REARWIN SPEEDSTER—Dry Kit GP-69, postfree, only \$4.85 (64½" span). In accordance with C-D's gas model policy, the motor unit with propeller, wheels and wheel shoes are not supplied with Kit (this gives model builders their choice on these items). Extra parts to complete GP-66 (except power unit) \$3.95; extra parts to complete GP-69 (except power unit) \$3.55. Add 85c to either parts kits (or \$1.50 with dry kits) if you wish 3½" M & M's, instead of wood wheels, or \$2.10 for 3½" M & M's.



CONTEST WINNING CURTISS FLC-2
Complete Dry Kit SF-47 (Span 23½"), \$2.50
Complete Dry Kit D-49 (Span 15¾"), 85c



Complete Dry Kit D-65 (Span 27½"), \$1.95
Very similar to Howard Hughes'



BOEING 247 TRANSPORT
Complete Dry Kit SF-35 (Span 55½"), \$4.05
Complete Dry Kit D-35 (Span 37"), 1.95



Complete Dry Kit D-55 (Span 42½"), \$2.50

The kit has a 1938-1939—with its flashy all-red speedline design and "high climb"—just the thing that is needed for contests these days. While designed for motors of 3/4" and 7/8" bore—for still better climb for contest work. From the word "go," it's a complete C-D creation (following no particular prototype) and directly in line with Cleveland's ever practical consideration, the nose has been made wide enough to easily accommodate all known engines. The whole power unit, meaning the engine bears with batteries, coil, motor, etc., may be made to remove from the fuselage in one unit for test or repair.

Climbs and glides beautifully, is very simple to build and has an extremely realistic look that so conspicuously marks C-D models. You'll be proud to call it yours. Don't delay ordering your Cloudster today. If your dealer hasn't it in stock, we'll rush yours to you postfree.

If you want us to include all dopes, cements, and M & M gas model wheels with your order, add \$1.75 to the \$2.50 price and of course if a motor is desired, send for this right with the kit. All standard makes in stock at regularly advertised prices.

Complete \$2.50
Dry kit No. GP 5004
ONLY

Build and Fly These Beautiful Authentic C-D Gas Models STINSON and REARWIN



SPAN 64½"
REARWIN
SPEEDSTER
DRY KIT
GP-69
\$4.85

C-D's GREAT NEW HANDBOOK CATALOG No. 5

MUST BE IN THE HANDS OF 50,000 MODEL BUILDERS BY CHRISTMAS. GET IT!

We have 50,000 newly printed gigantic hobby catalog which must be distributed quickly because of the big bargains contained within it, and we want every reader of M.A.N. to get one. Packed with thousands and thousands of items—many more than ever contained in our largest hobby catalog among them the 3 great lines of 135 C-D airplanes, also 100 to 150 C-D airplanes, including some of the less expensive models of other makers, and larger ready-to-fly models. Also model railroad equipment and toy trains, 26 up in O, C-B, OO, and HO gauge; a wide variety of gas model airplanes and all well-known makers of gas engines; gas and "rubber driven" supplies; also supplies for railroad and innumerable model uses; race car; hand tools and machinery, candid and movie cameras, etc., and a wide variety of ship kits. Nearly everything a model builder could wish for within its pages for only one thin dime. Send for it today!



U.S. ARMY MARTIN BOMBER
Complete Dry Kit SF-45 (Span 53½"), \$4.85
Complete Dry Kit D-45 (Span 35½"), \$1.95



CURTISS HAWK P-8E FIGHTERS
Complete Dry Kit SF-21 (Span 23½"), \$2.25
Complete Dry Kit D-21 (Span 15¾"), \$.85
Complete Dry Kit R-21 (Span 10"), \$.50



NEW C-D P-26-A FIGHTER
Complete Dry Kit SF-60 (Span 21"), \$2.25
Complete Dry Kit D-60 (Span 14"), 85c

ALL FOR ONLY 10¢

DEALERS: Get in on the "big prosperity push"! C-D's new low prices put new pep and life into Kit sales. You just can't lose out with our gigantic line. Write for full details today!

**CLEVELAND
MODEL & SUPPLY CO., Inc.**
Quality Model Equipment with Dependable Service Since 1919

4508-B80 Lorain Ave., Cleveland, Ohio, U.S.A.

★ ★ ★ ★ ★ ★ ★

BUD WARREN says:

"Your chances in gas model competition depend most upon your motor. Snapped at 10 second intervals at a recent contest these pictures show why."



1. "Your number is up!" The timer is ready. Powered with a Tom Thumb the motor sings with a single flip of the prop. The efficient 1/5 H. P. Tom Thumb cowls into a small space, permits streamlined ship design.



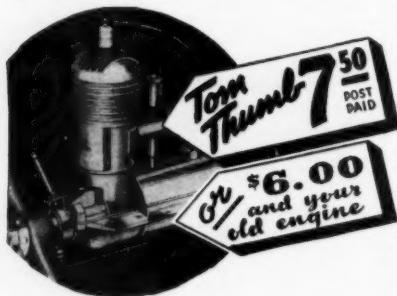
2. The official start! Humming at fast two cycle speed the Tom Thumb does not falter at this critical instant. Rocketing skyward the Tom Thumb on limited motor time reaches highest altitude for a winning flight.



3. Still going up! The glide of greatest importance must start at high altitude where soaring conditions are best. With a ship adjusted, all things being equal, success hinges on reliable performance afforded by a Tom Thumb motor.

SPECIFICATIONS and HOW to BUY the NEW TOM THUMB

The Tom Thumb is the most powerful easy starting 1/5 H.P. engine made. Clip the coupon below, enclose money order for \$7.50 (also your old motor for special \$6.00 offer), and receive a brand new assembled and block tested Tom Thumb. Complete with fuel tank, coil, Champion spark plug, one piece cylinder and head and other modern features. Complete flying weight 10 oz. (less batteries). Bore 7/8"; Stroke 13/16".



WARREN SALES & SERVICE

412 Brett St. Inglewood, Calif.

- Rush me one New Tom Thumb Engine. I enclose \$7.50.
- Rush me one new Tom Thumb Engine. I enclose \$6.00 and my old engine (any make) including all parts regardless of condition.

I intend to run my Tom Thumb—

Upright Inverted

Street.....
Name.....
City..... State.....

for the title of this article. Letters from all over the world have been received from model builders who have written about the performance of their ships. The first KG in the Rocky Mountain area was built by Harry Cornish and Robert Van Buskirk of Denver; while from far-off Australia, Mr. Ivor Freshman wrote that the KG was the first gas model to take the air in that section of the world. Other letters from Belgium, England, France, Finland and even South Africa tell of the fine performances of these ships.

What transport flyer wouldn't like to have the combined flying time to his credit of all the KG's that have been built. And speaking of statistics, if all the miles flown by these same KG's were in one straight line it would reach from Here to There and back again several times. A salute to a great ship!

The Amiot 341 Long Range Bombers

(Continued from page 11)

The structure is composed of two vertical oleo struts attached on each side of the main wheel axles, and with a definite forward set. Two rearwardly inclined articulated struts are attached near the wheel axles and at the bottom of the engine nacelles. Two small electric motors are attached at this latter connection in each gear at the point of articulation. This strut folds forward, hinging half its length, by the rotation of the electric motor and raises the main gear backwards and rearwards up into the tail of the engine nacelles. Retraction is abnormally swift and may be halted at any point and held rigid for an emergency landing should an engine failure accompany a hurried take-off.

Power is supplied by two Hispano-Suiza 14 Ha fourteen-cylinder radial, air-cooled engines developing 1,100 horsepower at 12,500 feet. These are mounted high in the wing, close inboard, and are supported by steel-alloy struts from the main wing spar, to which the landing gear struts are also attached.

Latest models of the Amiot 341 have been powered by the new Gnome-Rhone 18 Lars, 18 cylinder, double-row, radials developing 1,300 horsepower at 16,500 feet. This latter is definitely a high-altitude engine and performance in the higher stratas has been vastly improved. The propellers are Hispano-Suiza three-bladed, all-steel controllable pitch type.

Tankage consists of four main fuel wing tanks of 165 gallons each, or a total fuel capacity of 660 gallons. An oil tank of 45 gallons is located in each wing nacelle just to the rear of the engine. With this tremendous fuel load, the Amiot has a cruising range of 1,240 miles, twice that of standard types.

The crew is made up of a pilot and chief officer who is located high and forward of the main wing in a completely glassed-in steel hatch compartment situated slightly to the port side of the nose. Behind him in the same hatch is the radio officer and co-pilot. He is equipped with complete Marconi wireless and a special French Air Ministry method of ultra-short wave communication as yet undisclosed. This latter uses neither voice nor code and is accom-

plished by means of instantaneous frequency changes.

In the long, tapered, glassed-in nose is the forward gunner. He is armed with the new DeSautier 22 millimeter non-recoil aerial cannon developed by the French Air Force. This is fired through a sliding glass slit in the revolving nose turret in which the gunner is strapped. Behind him is the bombardier officer who handles the sighting and release of bombs. A bomb load of one ton is carried, a potent array of high-explosive strength.

The Amiot 341 has a wing span of 82 feet and is 49 feet, 2 inches long. The wing area is 538 square feet and it is 11 feet, 6 inches high. The structure, empty, weighs 8,800 pounds. Crew and equipment weigh 1,100 pounds; fuel and oil tankage, 4,400 pounds, and its useful load of 3,300 pounds augmentation to a gross weight of 17,600 pounds ready for flight.

Performance figures recently released after exhaustive tests by the French Air Force credit the Amiot 341 with a maximum speed of 295 miles per hour; faster than the speediest time recorded in the 1938 National Air Races by tiny, high-powered racing planes! Its cruising speed at 13,120 feet is 264 miles per hour. And here's an astounding fact: the Amiot has an absolute ceiling of 32,800 feet; more than six miles!

The ship is now going into extensive squadron service with the French Air Force and something like 600 are said to be on order. Such a harbinger of havoc might serve well as a peace measure in these troubled times. And the Amiot is more than a threat of destruction; it is a promise!

Build the Ship On the Cover

Select a straw-colored block of even-grained balsa about 6 x 1-3/4 x 1-3/4 inches and trace the side view outline on it.

Cut down with a band- or small hand-saw and trace the top view outline on. Cut this down to size and shape into circular section with a sharp knife or razor blade, taking extreme care excessive gouges are not made. Cut out cross section templates and apply to fuselage at points indicated

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ATWOOD 5/8" PHANTOM BREAKS WORLD'S RECORD



SPECIFICATIONS: Only engine made with Dowmetal crank case; 1 7th H.P. at 6500 r.p.m. (actually develops nearly 1 6 H.P.); runs upright or inverted; bare weight 3 1/2 ounces; flying weight with 2 pen light cells 7 1/2 ounces; hardened steel timing cam; new quick starting carburetor; oversize bronze bearings; entire engine may be taken apart with screw driver.



BILL GAGE, observer and A. E. MATHEWS, timer, congratulate BILL ATWOOD, right.

WESTERN UNION

THIS WILL CERTIFY OFFICIAL TIMING YOUR MINIATURE PLANE POWERED BY THE "ATWOOD PHANTOM MOTOR" STARTING TIME 11:05:27 AM AT BURDETTE AIRPORT LOS ANGELES CALIF OCTOBER 1 1938 TILL OUT OF SIGHT 11:52:10 PM. TOTAL TIME PLANE VISIBLE IN FLIGHT 2 HOURS 46 MINUTES 43 SECONDS.
CONGRATULATIONS!
THE WESTERN UNION TELEGRAPH CO A E MATHEWS 1045A

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NEW 1939
Atwood
PHANTOM M

★ Be Famous with a Phantom ★

FLIES 2 HOURS, 46 MINUTES
NON STOP; COVERS 55
MILES; REACHES 11,500 FEET

* * * The Most Remarkable
Demonstration of Reliability and
Performance in Model History!

BILL ATWOOD DOES IT AGAIN!

Checked by an official Western Union timer and observed by two following airplanes and two automobiles, a new stock 1939 Bill Atwood 5/8" Phantom Engine mounted in the 4 lb. 90" special Phantom plane and carrying 16 oz. of gas, broke three world's records in a sustained flight of 2 hours 46 minutes 43 seconds on October 1, 1938. This is the greatest 3-way record ever established by a miniature engine, bettering the previous record by 45 minutes, and is your guarantee that the Phantom will give you the greatest performance you can buy at any price.

Taking off from Burdett Airport, Los Angeles, the Phantom Engine pulled the plane to a checked height of 11,500 feet, and in wide circles worked its way to the north above the treacherous San Gabriel mountains. Over Lancaster, California, 55 miles



distant, the second of the observing planes was forced down for refuelling and at that point the Phantom was still in the air — no one knows how much longer it remained aloft. A reward has been offered for its discovery.

This is Bill Atwood's latest — and greatest — record. Atwood designed engines have won a staggering list of events, including two California State championships and the world's records for Class C boats with a speed of 39.24 m.p.h.

You will never be satisfied with less spectacular performance than the Atwood Phantom gives you. Insist on a Phantom and break your own world's records. Order today — shipment guaranteed within 24 hours.

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Please rush prepaid to me the items I have checked below:

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This plane will outclimb anything with equal power. You have to see it perform to appreciate it.

EVERY BERKELEY GAS MODEL KIT INCLUDES:

- Full Size Plans with pictures and three-dimensional sketches of the construction.
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Everything is included to complete the model exactly as pictured with the exception of the power plant and wheels.

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Official I.G.M.A.A. Record
Breaker 57 1/2 Minutes on 2 Min. Engine
Run. This plane that started a new era
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Nearly every model builder dreams of the day when he can own and fly a "Custom-Cavalier." There is no model like it. Easily adapted for radio control.

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8 ft. Wingspan
Simplified MONOCOQUE
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Full 1/6 h.p. with power to spare. The only unconditionally guaranteed motor in its price class.

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1/7 Horsepower
5/8" Bore x 3/4" Stroke

The engine that powered the "Buccaneer-48" to the Small-Bore Championship. Easy starting and gives nearly two lbs. static thrust.

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Now you can install a "Stop-Watch" Timer in your lightest gas model at no increase in price. New dual timer weighs only 1 1/4 oz. Adjustable with split-second accuracy up to 55 seconds.

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Standard propellers are mahogany stained and varnished. DeLuxe Propellers have metal washers and are perfectly balanced by new machine method.

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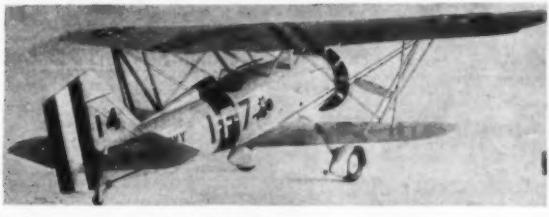
Announcing New 1939 Series of World's Finest Models

NEW CURTISS HAWK F11C4 NAVY PURSUIT



32½" Span, Length 22¾", 1" Scale, Weight 6 oz. Color grey, top wing yellow.

The most exclusive and finest equipped model in the world. A special de luxe model, one of the most beautiful ever made. Set contains a 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4½" aluminum cowls, 10" steel type carved prop shown, 2½" wheels, tail wheel, star and rudder insignia and lettering, rubber windshield, instrument board, flying wires, 4" aluminum step plates, aluminum wing walk, ready cut wheel pants, wire, washers, 3 oz. grey paint, ½ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood. 33" x 11" scale drawing. This model has movable controls from the cockpit. Const. set, complete in \$4.50 labeled box, postpaid.



LOCKHEED ELECTRA EXHIBITION MODEL



27½" Span, Length 19½", Scale ½"

Plans approved authentic by Lockheed Aircraft Corp. This is a De Luxe model with special equipment. Set includes two 2" celluloid motors, aluminum motor fronts, two 2" propellers, two 2" tapered aluminum prop., two 1½" M. 10" celluloid propeller air wheels, all parts printed on balsa, set of colored paints, glue, etc. This \$4.50 is the finest transport model made. Set, postpaid.

Standard Set No. 2, same as above without special equipment. Flying \$2.95 model type. Set, postpaid.

NEW LOCKHEED ARMY SPEED VEGA



30¼" Span, Length 21", Scale ¾", Color Blue and Yellow.

This model with its bullet-like nose and high lift type wing is one of our best flyers and most stable. It is handsome to look at and very strong. Const. set contains all parts printed on balsa wood, 3" scale celluloid motor, 10" propeller, 2½" wheels, 10" propeller steel type shown, colored insignia, rubber motor, celluloid, wire, complete set of colored paints, glue, etc. Special wheels, tail wheel, full size scale drawings, and all parts to build as shown. CONST. SET, COMPLETE in box, \$2.75

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CONST. SET, 41" Span, 1" Scale. Larger model of same plane. \$4.95

BOEING F4B4 NAVY FIGHTER

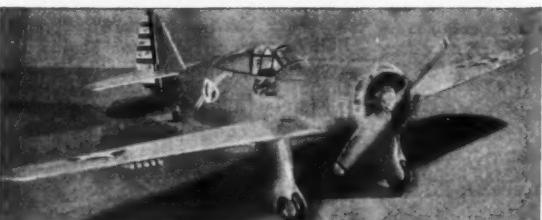
SOLID EXHIBITION MODEL



22½" Span, Length 14½"; Color Grey, etc.

This is the finest solid exhibition model ever produced. Set contains completely finished balsa fuselage, with cockpit cut out, motor hole cut out and headrest attached; all you have to do is paint it. The wings, tail and rudder are all cut to shape, but have to be sanded to proper curve. A 3" celluloid motor with aluminum motor front, 3½" tapered aluminum cowls, 7" scale chromium plated propeller, 4 cast bombs, 2 celluloid wheels, tail wheel, complete set of colored paints, glue, filler and all \$4.50 other parts with full size drawing. Set, postpaid.

NEW CURTISS ARMY HAWK 75 or P36A



37" Span, Length 27", Scale 1"; Color, silver

An exact scale model of one of the 210 planes of this type ordered by the U.S. Army. Const. set contains a 4" turned balsa motor front, 10" prop shown, insignia, aluminum wheels, set of colored paints, all parts printed on balsa, full size large \$3.25 scale drawing, and all parts to build as shown. Set, postpaid.

De Luxe set, same as above, but with 4" celluloid and aluminum cowls, \$4.00 postpaid.

BOEING F4B4 NAVY FIGHTER



23½" Span, Length 14½", ¾" Scale

Set has 3" celluloid motor, 3½" tapered aluminum cowls, ring, pants, etc. Postpaid. \$2.95

BOEING P26A ARMY PURSUIT



22" Span, Length 17½", ¾" Scale

Set has 3" celluloid motor, 3½" tapered aluminum cowls, ring, pants, etc. Postpaid. \$2.75

CURTISS Y-1-A-18 ARMY FIGHTER



38" Span, Length 28", Color, all silver

Latest of the army attack twin motors. Set has turned 3" motor fronts, 8" props shown, colored paints, etc. Postpaid. \$4.50

NORTHROP A-17 ARMY FIGHTER



24" Span, Length 17", ¾" Scale

Set has 7" prop, turned motor front, wooden wheels and complete set of paints. Postpaid. \$2.50

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NEW 20-PAGE CATALOG, beautifully illustrated, with large photos of the world's finest scale models. SEND 10c COIN.

LOCKHEED P28A NAVY FIGHTER



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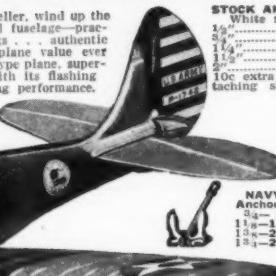
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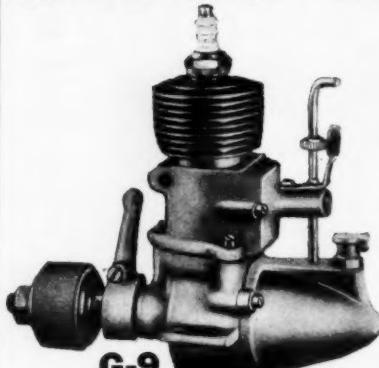
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Use PERVEL on your next job. We GUARANTEE SATISFACTION UNDER ALL CONDITIONS.

**THREE 24x36" SHEETS
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Build and Fly This Cloud Chaser

(Continued from page 13)

wing and stabilizer. Stabilizer's leading and trailing edges and center piece are 1/16 x 3/16-inch balsa strips. Tip pieces are same size but are set on edge to give greater gluing surface for the twin rudders. Diagonal stabilizer bracings are 1/8 x 1/16-inch balsa strips.

Bevel the two pieces which form the stab's. leading edge, then pin these and the trailing edge down on your drawing and cut bracing to fit, making joints as indicated on drawing. Precoat all joints with thinned cement, using normally thick glue for final assembly. When cement dries, stabilizer is turned over and covered with white tissue. Grain of paper should run from leading to trailing edge, not lengthwise. Even though the covering is not to be shrunk, sun will tighten up tissue and surface might warp were grain of covering tissue to run parallel to trailing edge.

If this is your initial covering attempt, don't be discouraged if it seems difficult. Keep trying until a smooth covering is attained. This is best done by applying thin dope to leading and trailing edges and end ribs, then stretching slightly larger piece of tissue over stabilizer frame and pulling taut with finger tips. Remember—don't shrink tissue with

water or try to dope the paper.

Twin rudders are cut from 1/20-inch thick sheet balsa. Edges of rudders are sanded round, then glued, one to each end of the stabilizer, after precoating cementing surfaces. Be certain rudders are parallel.

When complete, entire tail unit is glued on motor-stick with the covered side of the stabilizer on top. The stabilizer rests flat on stick at no degrees of incidence and is off-set slightly, as shown, to make model circle to the left. This is known as circling the model with torque.

Wing spars are 1/8 x 3/16-inch strips. Pin them down on the full size panel drawing. Ribs are cut from 1/16-inch sheet balsa by using a metal or cardboard template. Using this template pattern, cut sixteen ribs each 1/8-inch deep. Leaving out the two center ribs, fit remaining ones into place between leading and trailing edges by cutting off rear portions until all are in place. Precoat cementing surfaces, then glue ribs in position. This method of tapering the wing by cutting a bit more off the rear of each rib while working outwards from the center eliminates stalling wing tips, thus adding to the efficiency of the main lifting surface.

Wing tips may be bent from 1/16-inch square bamboo or reed. Dihedral is obtained by raising one wing tip 6-1/2-

inches off working board when other wing panel is flat on board. First precoat the surfaces which will touch, then glue the two panels together. Cement the two center ribs together and glue in place. After drying, again coat joints with glue.

While the wing is drying, bend the two wing clips from No. 14 wire to the exact shape shown on the plans. After wing panels are glued together, precoat wing spars where clips will be attached, then cement clips to wing. Bind clips to spars with fine thread and coat with glue. Clips should fit motor stick snugly, but not so tightly that wood is cut deeply by wire.

Using white tissue cover the top of the wing, one panel at a time, with the grain of the paper running parallel to ribs. A good wing-covering method is to start with a piece of paper slightly larger than the panel which it is to cover. With dope as an adhesive, attach paper to center rib. Then work slowly outwards towards the tip, a few inches at a time, applying dope to leading and trailing edges with a small artist's brush, smoothing out the tissue with the finger tips.

The landing gear which protects the propeller as well as permitting R.O.G. take-offs, is also bent from No. 14 wire. Wheels are 1-1/8-inch circles cut from 1/8-inch thick sheet balsa. Cut two circles for each wheel and after precoating glue together with grain of wood running opposite, as shown. Washers are glued to both sides of each wheel, then wheels are slipped on wire landing gear and ends of wire bent up. See illustration.

Instead of cementing landing gear to motor stick, thin rubber wrapped around the wire and stick holds landing gear in place. This permits gear to be quickly removed for hand-launched trials.

Final phase of construction is one of the most important. It has been wisely worded: a propeller can make or break a model. The prop for this cloud chaser is carved from a balsa block 1-3/4 x 1 x 12-inches in the four steps illustrated, or a 12-inch, machine-cut, partially-com-

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TRADE MARK

SPECIAL INDOOR SUPPLIES

JASCO'S first international recognition was its introduction of specialized indoor products for indoor flying. It is now available to model builders by making available at all times the lightest balsa in all three grades, plus the best quality of glues and adhesives. The quality of JASCO products has never been questioned, nor its quality ever equaled. Manufacturing indoor balsa and glues is a product of years of intensive work and practical model flying experience. Also, the profit motive must be secondary since indoor balsa and supplies must pass at least your production costs.

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Because JASCO prices are normal. The popularity of its supplies can only be explained by the increased production last year of one year. Find out why Champs in every field, indoor, outdoor, gas and gliders, recommend JASCO products. Send a postal for your copy of our 1938 Catalogue and Handbook.

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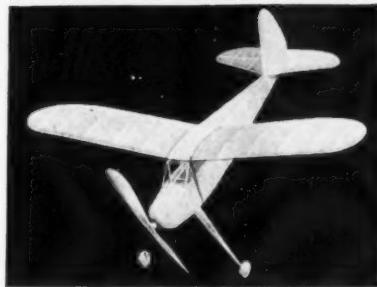
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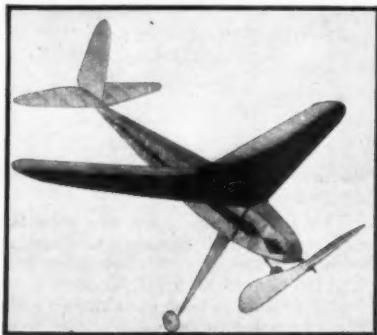
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25c



RECORD WRECKER

Newest Modelcraft Sensation! With a 24" span the Record Wrecker includes freewheeling unit, rubber lube, contest rubber, best quality balsa, cement, dope, and large full size plans. Add 10c for postage.

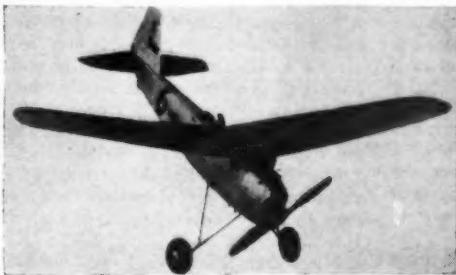
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1939 PACIFIC ACE GAS MODEL

New throughout, with latest improvements in design and construction. Flying weight 3 lbs., 4 oz. Wing span 66 in., tapered from 12 to 5½ in. Kit contains formed landing gear, formed aluminum (Orwick) cowls, die-cut ribs, inflatable air wheels, hook-up wire, cement, dope, complete. Dry kit same as above without cement, dope, silk or wheels

\$8.50
\$4.75



1938 SCOUT GAS MODEL

A ship for POWERFUL flying, with a 60" tapered Clark Y wing. Kit contains formed landing gear, ready-cut ribs, formed face plate and cowl, switch, hook up wire, cement, dope, silk, full sized plans and Voit air wheels. Only.

Prepaid in U.S.A.

Special money saving deal: Kit, Timer and Ohlsson engine. \$25.00 SAVE \$2.25

Same kit with bamboo paper and rubber Donut wheels

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POWER WITH BRAT, TROJAN, HUSKY, ELF OR CHUNN ENGINE. Boys, here is the plane for you. Easy to build, and flies smooth as a Gull. 38" tapered wing. Kit complete with cement, dope, wheels, covering, printed ribs, formers, etc.

Deluxe kit with Traxler air wheels and silk covering

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NEW FLIGHT TIMER

Adjustable from 1 second to 1 hour. Weight ½ oz. Accurate, reliable. Complete to drilled mounting holes. Ready to attach wires and install in ship. The first dependable timer made just for models...

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9", 12", 13", 13½", 14"

Same high-quality Sogard Propeller with true pitch, accurate balance, maximum thrust and minimum torque.

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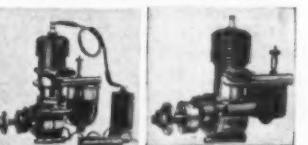
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For that extra margin of performance.

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Horsepower 1½, Bore 5½", Stroke 13/16", 500 to 1000 r.p.m. \$16.50 Post Paid

TROJAN JR.



The only motor using roller bearings.

SPECIFICATIONS
Horsepower 1½, Bore 5½", Stroke 13/16", Bare weight 3½ lbs., Overall height 3½", \$16.50 Post Paid

BRAT



SPECIFICATIONS

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EASY TO ASSEMBLE—EASY TO OPERATE—HIGHEST VALUE—\$5.00

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Gas, Bat-
teries or Pro-
peller included

ONE DAY
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Over 7000 of these same, famous G.H.Q. gasoline engines have been sold at \$8.50 during the past year alone. Mass production methods and enthusiastic reception have enabled us to reduce the price from \$8.50 originally to the NEW LOW PRICE of \$5.

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THE G.H.Q. GAS ENGINE KIT IS ABSOLUTELY COMPLETE!! ALL MACHINING DONE—ALL YOU NEED IS A SCREWDRIVER!!

G. H. Q. KIT OFFERS MANY SPECIAL FEATURES

1. New High Compression Piston and Cylinder
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AN ENGINEERING TRIUMPH AT A RECORD LOW PRICE

Indeed an engineering triumph based on years of exhaustive scientific aerodynamic research. The G.H.Q. motor has broken records for amazing performance... flies model planes up to 10 foot wingspread... just as efficient for boats, etc. Easy to start and simple to operate.

HOW TO ORDER: WE SHIP EXPRESS COLLECT C.O.D. FOR BALANCE

SEND ONLY \$1.00

ILLUSTRATED
CATALOG 3c**C.H.Q. MOTORS, INC.****854M East 149 Street**

pleted prop may be finished off and used. It is quite possible that some builders might make use of both types of propellers and compare performances.

In either case, the prop shaft is bent to shape shown from the same size wire as the other fittings. The shaft is cemented in place and several flat washers or a single ball-bearing washer is placed between the propeller and thrust bearing.

For trial flights your cloud chaser may be powered with eight strands (four loops) of 1/8-inch flat rubber which has but little slack. After adding rubber, adjust the wing on the motor stick until a smooth glide is evident—then move the wing clips back about 1/16-inch and hand-wind the motor to a double row of knots.

With this power the model has been found to rise-off-ground or climb from the hand and turn in creditable flights. If model stalls in flight move wing back slightly; if take-off is slow try moving wing forward.

Should the eight strands of rubber prove insufficient to send the ship skyward in a suitable climb, add extra loops until a fast, even climb is obtained. Fully wound, with a right-hand prop, the craft may dive in on the left wing. To remedy this, increase the incidence of the left wing by bending up the leading edge and

bending down the trailing edge. This is best done by bending the wire clips with pliers instead of breathing on wing. Known as "wash-in" this adjustment is one of the first to be found in the expert's bag of tricks.

When the cloud chaser is correctly adjusted it will be apparent that the model is a high and stable flyer; so unless you're out in the wide open spaces, it may be advisable to have the plane slightly under-powered. Remember that a plane in the hand is worth two in a tree.

When good flights become "old stuff" try experimenting with various sizes of rubber and loop lengths. Then fly the model with larger propellers and compare the duration of hand-launched with R.O.G. flights.

But either R.O.G. or hand-launched—you're bound to like this big sturdy flyer.

Table of Approximate Weights

Wing	.30 ounces
Stick	.56
Landing gear	.15
Propeller	.19
	—
Rubber	1.20 ounces
	—
	.50
	—
	1.70 ounces complete
	ready to fly

MARPELL—Streamlined Gas Model Wheels

Designed For Perfect Landings
When your gas model . . . new and shining . . . comes
gliding in, it creates a prompt stir of interest—that pleased
expectancy of a perfect landing.

Safeguard your ship at this thrilling instant with Marpell wheels of exclusive streamlined RAISED-TREAD design. Truly light weight Marpell tires are vulcanized of the highest grade ebony-finished rubber. The hub is of heat treated, highly polished duraluminum with a bronze bearing. A patented "Air-Check" inflation valve holds air pressure indefinitely. Inflating adapter furnished.

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Send postal money order direct.
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Your choice, 4½" or 3½" diam.
Bronze bearing fits
¾" axel. Per pr.
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Tail Wheel Included
A new streamlined tail wheel of live
rubber will be included with your order.
This is not a fat, spongy, do-not type
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Have you seen the new G.H.Q. discount schedule and sales helps? Write in on letterhead today.

NEW YORK, N.Y.**Required Materials***Balsa Wood*

- (1) 3/8 x 1/2 x 28 inches.
 - (2) 1/16 x 3/16 x 18 inches.
 - (4) 1/8 x 3/16 x 18 inches.
 - (2) 1/8 x 1/16 x 18 inches.
- Half sheet of 1/20-inch sheet.
Half sheet of 1/16-inch sheet.
Half sheet of 1/8-inch sheet.
Block 1-3/4 x 1 x 12 or (12-inch machine cut prop blank).
- 3-ft. No. 14 wire.
- Large thrust bearing.**
14-ft. 1/8-in. flat rubber.
1/16-in. Bamboo or Reed (12 inches).
Sheet of White Tissue.
Dope, Cement, Washers, Thread.

GAS LINES

(Continued from page 25)

Burlington, Iowa, who received a total of 256.5 points.

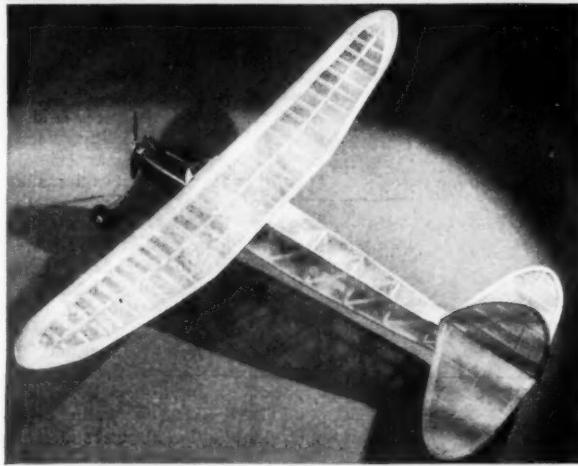
This performance event was something entirely new. Bob Sommers thinks it will eventually supplant the endurance event held so regularly in all countries, and would be glad to hear from contest directors interested in the event. Just drop a note to him in care of Stix, Baer & Fuller Co., St. Louis, Mo.

A special prize was given to the contestant who had the most outstanding development in design, regardless of type. Judged on adaptability and uniqueness, the award was given to Donald Lueke of St. Louis. David Seltzer, another St. Louisian, won the Stix, Baer & Fuller Trophy, awarded annually to the best local all-round contestant.

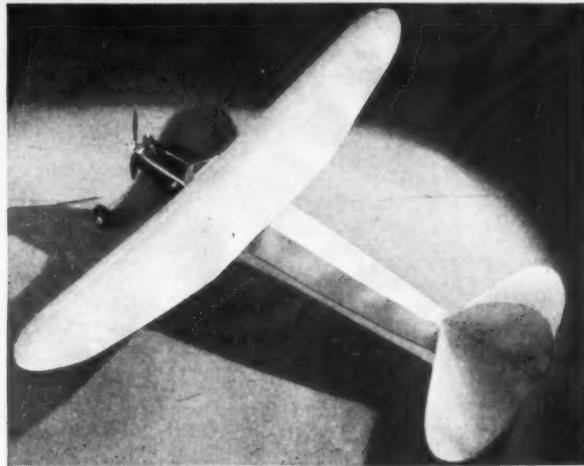
After the meet a dinner was given at the De Soto Hotel in St. Louis. There was lots of good entertainment, and outstanding speeches by George Page, Chief Engineer of Curtiss-Wright, Jim Malone, test pilot, and others. To add a special touch to the affair, Contest Director Sommers had the prizes awarded by a young actress.

The meet received a great deal of free

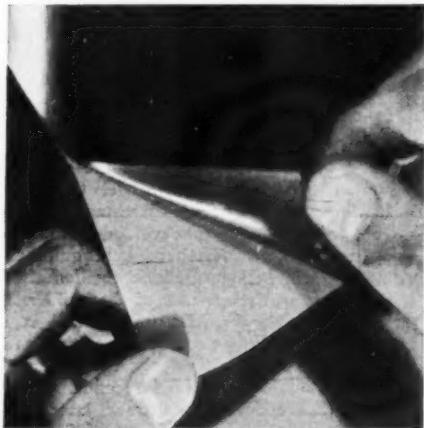
PLANEFLIM—*for Covering Model Planes*



This shows the transparent PLANEFLIM covering—drumlike—all the intricate detail of the interior is clearly visible.



This shows the opaque PLANEFLIM covering—drumlike—and Maximum high gloss finish.



Removing tough flexible PLANEFLIM from its backing sheet ready to apply to any model.

WORKS LIKE MAGIC STRETCHES ITSELF—DRUMLIKE

No Wrinkles—No Seams

After many painstaking hours of tedious work, you finally complete the frame work of your model and find yourself confronted with the serious problem of covering it. The covering alone represents your finished model. It completely covers the frame work on which you pride yourself. Why, then, isn't it of the very utmost importance to get the most practical, efficient and attractive covering obtainable? The answer to this is PLANEFLIM, a product developed after exhaustive research and study of the problems that caused every model builder innumerable heartaches. PLANEFLIM is so simple and speedy to apply that the most inexperienced builder will marvel at his results. It is a REVOLUTIONARY DEVELOPMENT FOR COVERING MODEL PLANES that had never been conceived until now.

CONCRETE REASONS WHY PLANEFLIM WILL COMPLETELY DOMINATE ALL COVERINGS ON WINGS AND FUSELAGE IN THE FUTURE.

No glue or dope necessary; patches easily, quickly and invisibly; ready for applying when it reaches your hands—tough, elastic, attractive, at least 50% lighter in weight—no seams, where you lap one piece of PLANEFLIM over another—it actually becomes one smooth level single joint.

PLANEFLIM stretches itself, drumlike, over the wings and fuselage, completely eliminating one of the most troublesome and tricky operations in covering a model plane; that is, stretching silk or paper over the frame, then brushing on dope, many coats of which are necessary to give it the appearance you wish—will not tear, but if it is pierced, the repair can be made in the field in a fraction of a minute on any size hole; then the ship is immediately ready to fly without further delay.

PLANEFLIM is scientifically manufactured on micrometer machinery which is adjusted as close as ten thousandths of an

inch. THIS ASSURES YOU THAT WHEN YOU COVER, YOU HAVE AN ABSOLUTELY EVEN DISTRIBUTION OF WEIGHT AND PERFECT BALANCE SO NECESSARY TO GOOD PERFORMANCE.

PLANEFLIM is attached to a backing sheet; therefore, it is easily handled, easy to cut to shape, as the film which is attached to a backing sheet is more or less stiff, but after you have cut the PLANEFLIM to fit a particular part, you then strip the film from its backing sheet, and when you have the film removed from its backing sheet, it is soft, pliable, and actually forms itself to the many curves necessary in model building.

PLANEFLIM comes in many colors. The speed of application is hardly believable—a 7 ft. wing spread was covered in 20 minutes.

JOBBERS, RETAILERS, AND USERS WRITE IMMEDIATELY FOR FURTHER DETAIL

PLANEFLIM DIVISION

Lock Box 166

DAYTON, OHIO, U. S. A.

"PROFESSOR" KITS PIONEER 2 NEW FEATURES

54" JUNIOR MODEL FOR POPULAR 1/5 HP ENGINES GIVE AMAZING STRAIGHT-UP CLIMB — NEW STREAMLINED MONO-WHEEL LANDING GEAR — LESS DRAG — FLATTER GLIDES — BETTER LANDINGS

(Conventional two-wheel landing gear also included for those who prefer it)

**SPECIFICATIONS**

—3 Sizes to Choose From—

	JUNIOR	SENIOR	SUPER
Span	54"	61" 1"	9 ft. 2"
Length	41"	57 1/2"	87 1/2"
Wing Area, sq. Ft.	4 1/4"	4 3/4"	10 1/4"
Weight, complete.....	28 oz.	39 oz.	6 lb. 5 oz.
Motor H.P.			
KIT PRICE complete			
less motor and wheels.....	\$4.95	\$5.95	\$14.50
Price with airwheels.....	\$5.65	\$7.50	\$16.25
Add postage and handling.....	25¢	35¢	75¢
(unless bought from dealer)			

Motors may be
upright or inverted

EASIER TO FLY—Special (only on Korff Kits) slow stalling wing tips (NACA 6412 airfoil)—Approx. 8 oz./sq. ft. wing loading—Low center of lateral area in line with center of gravity—High line of thrust.

MORE EFFICIENT—Fuelage of elliptical cross-section—excessively streamlined—elliptical planform wing—NACA 4512 airfoil (soaring section)—Low drag motor cowls—Special "T" section tail surfaces eliminates "blanketing effects."

PRACTICALLY CRASH PROOF—New type free-swinging, detachable wing. Soft balsa nose spinner protects motor—Flexible landing gear—Quickly replaceable. "Breakaway" mounts protect motor and plane.

EASIER TO BUILD—Greatly simplified method of construction—Many finished parts—Easy to read, full size plans—Fully illustrated notes and details.

KITS ARE COMPLETE—Cutout and notched ribs, wing tips, and formers; turned balsa spinner for propeller; all strip and sheet balsa cut to size and of finest quality; plenty of material for battery box, motor mount, and other details; landing gear and tail skid wire; wheels; celluloid for windshield; wiring; hardware; bamboo paper; cement; clear and colored dopes;—Easy to understand, full size drawings, clearly illustrated.

PLUS—"Testing Gas Models and Stability Facts" written by an Aeronautical Engineer.

GAS MODELS AND SUPPLIES EXCLUSIVELY

PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

THE KORFF CO.

607 EAST 39TH STREET

INDIANAPOLIS, INDIANA

publicity, with many pictures used, as well as two broadcasts directly from the field, several interviews and many spot announcements before the contest. Sommers and Publicity Manager Hanns Kolmar estimated the crowd watching the flights at about 3,500.

Picture No. 12 gives evidence of the large crowd which attended the contest. An exact scale Curtiss Robin is shown in the foreground.

On September 10th, the Quaker City Gas Model Airplane Association held its second annual Invitation Meet at Northeast Airport, Philadelphia, Pa. It was a huge success and attended by a large crowd of spectators. Events were held for engines with bore of more than 5/8" and less than 5/8"; an event for spectacular flying and an event for the duration ships in a "beauty" contest. (No "make-up" was allowed in this). The meet brought forth many outstanding designs. One of them was an exact scale model twin-engine Douglas transport. It is shown in picture No. 13.

Picture No. 14 shows a two-motored seaplane. It appears that model builders are wandering from the customary paths of design; which fact indicates that originality in builders is not entirely dead. We believe that this trend should be encouraged and that contest rules should not be such that they would discourage builders from working out their new ideas. These contest pictures were sent to us by Robert Hainley of 426 W. Chew Street, Philadelphia.

Atlanta, Georgia, is "coming to the fore." A large contest was held there on Labor Day by the Atlanta Aero Engineers of 2049 Robson Place, N.E.—an N.A.A. chapter. The club director is J. K. Coppage, who tells us they now have a membership of 45, and growing steadily. This club enjoys the distinction of being the first gas model chapter, obtaining its charter on December 16th, 1937.

Picture No. 15 shows a line-up of some of the planes and contestants who took part in the meet. More than \$350 in prizes were awarded by the Atlanta merchants and business men. First prizes were won by Frank Brittain and Ralph Blanchard of Atlanta, and Bob Hogset of Gainesville, Ga. Brittain won both the senior construction and flying events. There were about 5000 spectators on hand to witness the flying.

Educating With Models

Young men who are taking up aviation as a career find that models serve as a very effective instrument in attaining the full understanding of aerodynamic principles. A great deal of foresight is shown by Mr. Parks of the Parks Air College: for he has installed a system of model designing and building to supplement the studies undertaken by the pupils attending his institute. Mr. Douglas T. Peck, president of the gas model club at Parks, states:

"It is hard to find a better way to learn the fundamentals of model aerodynamics than by building and flying as model air-

planes. The club membership represents eight states and Canada. Pooling ideas from various parts of the country, as we do in our meetings, broadens the viewpoint of each one and so makes our hobby of still greater value in preparing for aviation careers. For that matter, the reason that most of us are studying aviation is that when we were 13 or 14 years old we became ardent model builders and contestants. Our hobby was the deciding factor in the selection of our career field."

His interest in model building, Peck stated, dates from his grammar school days. Then it was that a friend made him a present of a year's subscription to MODEL AIRPLANE NEWS. As a result, he began the building of rubber band-powered planes. Visits to the home town airport followed. Gradually there developed a well defined determination to become a part of the new field. Accordingly, throughout high school, he made a determined effort to earn a creditable record, especially in math and the other sciences, for he realized the value of a solid foundation for his future study of aviation.

Picture No. 16 shows the busy workroom at this college with the members of the gas model club actively engaged.

Pete Dillen, president of the Jackson Gas Model Club of 636 St. Clair Street, Jackson, Michigan, writes and says that though he is rather late in reporting the contest held by the club on August 14th, he hopes we will pardon him. The official name of the contest was the second annual Rose City Gas Model Contest. It was attended by 64 contestants "and gobs of public." However, due to an eighteen mile wind, there were quite a number of crack-ups which thrilled the spectators at the expense of the builders. Walter Good of Kalamazoo, Michigan, came through in great style with two out-of-sight flights, the longest flight time being six minutes, eleven seconds. The ship was recovered one week later, 42 miles from the starting point. Second place went to Jack Raymond, flying a Condor-powered Thunder Bird. The procedure of running the contest was similar

THE CHALLENGER!

68" Wingspread—Wt. 3 lbs.—Power 1/6 or 1/5 H. P.

Due to the great demand for this model we are able to offer it to you at an amazingly low price. This kit is absolutely complete, and it is not necessary to buy another item to finish the model except for power plant.

A few contents of the complete kit are: Full size plans; ready cut wings and tail ribs; semi-finished prop; balloon type wheels; ignition equipment; all strip wood cut to correct size; special spring wire; all necessary liquids; etc. only \$4.85 P.P.

The Deluxe kit contains inflatable airwheels, colored dope, and monogrammed propeller (static size desired)—\$6.75 P.P.

See these kits at your dealer. If he can't supply you, order direct. Immediate delivery.

V. K. MODEL AIRPLANES & SUPPLIES
7304 Main Street Williamsville, N. Y.

For Competition or Fun

FLY BESHAR MODELS

Beshar Models are scientifically designed and suitable for every builder. For competition the expert gets high climb and a flat glide on 30 seconds motor run. For the modeler who wants flying enjoyment, these models are easy to construct and extremely rugged for every day flying.

FLASH

Corsairs win on 30 second motor run

1 place Syracuse	3.16
1 place Allentown	4.20
1 place Paoli	4.24

Proving its competitive abilities.



"ALPHA" CORSAIR

5 ft. 8 in. span for 1/5 to 1/3 horsepower motors. Weight 2 lbs. 6 oz. complete. Fits NAA rules. Kit complete with wood, glue, dope, wheels and finished prop. \$4.75

The "CORSAIRS"

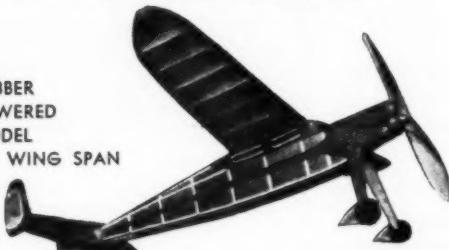
The Corsairs lead in modern design with twin rudders for stability and easy adjusting. They have Super Stressed easy construction and Simplified tapered wing. The Kits are complete with 3 view plans, all wood, glue, etc., are of Beshar quality.

"BABY" CORSAIR

3 ft. 6 in. wing span for 1/7 to 1/12 horsepower small bore motors. Climbs spectacularly and glides like a soarer. Complete Kit with plenty of extras. \$3.00

New! THE "BRIGADIER"

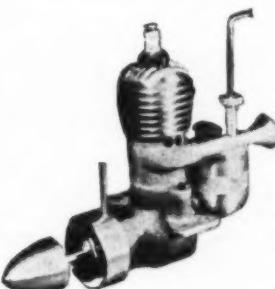
RUBBER
POWERED
MODEL
27" WING SPAN



A beautiful modern rubber model that flies 1/2 mile and over 2 minutes, can be used for endurance contests. Complete Kit with prop. \$7.50

NEW SMALL BORE MOTOR . . .

THE "BANTAM"



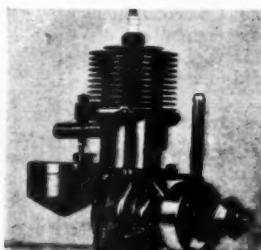
Approved by Beshar, designed by Ben Sherashaw; will fly models up to 36 oz. weight, has app. 1/8 horsepower and 1/8 bore and stroke. 500 to 10,000 R.P.M., and weighs 7 ounces with batteries. High Quality materials throughout and comes complete, mounted, tested, with coil and condenser. Order yours today. \$16.50 F.P.



OHLSSON "23"

1/7 horsepower and quality workmanship

\$16.50



FORSTER BROS.

1/3 horsepower for large models and super power

\$17.75

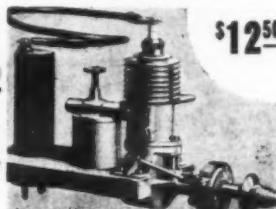
BROWN "D" MOTOR

\$10.00 P.P.

Complete
READY TO RUN
With Coil & Condenser

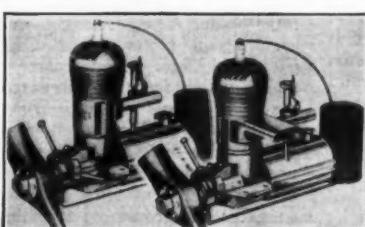
MODEL
B \$21.50
C \$17.00

\$12.50



HUSKY JV.

For Small Models, the new 1938 Husky JV. Weighs only 6 1/2 ounces, can be used inverted. Needs no condenser, as it has a combination coil. For models 3 to 5 feet it is the wonder motor at the wonder price.



BUNCH MOTORS

All Bunch engines full 1/8 H.P. at 5200 R.P.M.; Bore 7/16"; Stroke 13/16"; Bare weight 6 1/2 oz.

Engines assembled and blued, tested, or kits are complete with coil, condenser, fuel tank, and Champion spark plug. Engine kits supplied with piston, piston rings, and main bearing fitted, ready to run, and with timer assembly set up and points adjusted, so that the engines can be assembled and tested within one hour's time.

MIGHTY MIDGET Upright Assembled	\$ 7.50
MIGHTY MIDGET Inverted Kit	7.75
MIGHTY MIDGET Inverted Assembled	9.75
MIGHTY MIDGET Inverted Kit	7.75
GWIN AERO Upright Kit	12.50
GWIN AERO Inverted Kit	9.85
GWIN AERO Inverted Assembled	12.50
GWIN AERO Inverted Kit	9.85

3 1/2" Air Wheels	\$1.50
Austin Timer	.12.5
Coils (best obtainable)	.15
Pt. Berryloid Cement	.60
Pt. Berryloid Dope (clear or colored)	.50
Condensers (best)	.15
Booster Plugs (set)	.30
Silk, Sq. Yd.	.45
Bamboo Paper, 24x36	.05

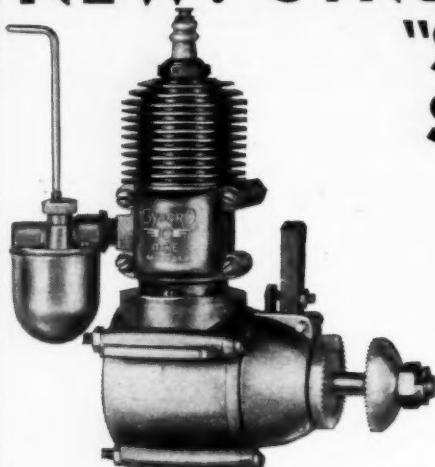
BESHAR MODELS —
329 EAST 54 STREET

*The greatest name
in model planes*
NEW YORK, N.Y.

NEW! SYNCRO ACE "SPECIAL"

\$9.95

At your Dealer



For many months, model builders and dealers have asked us to produce a motor that had the unexcelled performance of the Syncro ACE at a low price. One of those seemingly impossible jobs. But we have done it. It has been made possible partly by certain changes in design; and partly by economies due to increased production. Best of all, there has been no sacrifice of quality. The Syncro ACE "SPECIAL" gives you PERFORMANCE—performance found in no other engine—at a price that makes it easy for you to have the best.

ASK YOUR DEALER

Have him show you this outstanding engine. Or write for illustrated literature containing complete specifications.

SYNCRO DEVICES, INC. 523 Boydell Bldg.
Detroit, Mich.

HERE is something new for you fellas who build flying model airplanes.

SCALE MODEL SUBMARINE S-50

19" lg. with adjustable fin, water ballast chamber and air valve located in dry dock. Runs surface or under water. Die case conning tower, naval gun and keel parts. Brass propeller and trim. S-50 Submarine Kit (\$4 completely machined parts ready to assemble)

13 inch model completely assembled \$1.50 P.P.

13 inch model kit (40 parts) \$1.00 P.P.

SCALE MODEL SUB CHASER CP-375

20" lg. 5/8" beam with heavy duty spring motor driving twin screws thru a midship gear. Kit includes complete hull, deck, interior, metal and die cast parts, stamped aluminum cabin, windshield & lifthead, die cast naval gun and ventilators. Brass propellers and trim. Ready to assemble \$2.75 P.P. Completely assembled in Navy Colors \$3.95 P.P.

Send for FREE catalog of other models
WESTLAKE MODEL CO., Dept. M-128 ERIE, PA.

Howes REDUCED
ADJUSTABLE PITCH PROPELLER

PRICE, NOW \$1.75

This is the finest and most beautiful propeller that has ever been manufactured. In our files there are statements telling of its efficiency and great success.

The blades are held firmly in the hub and cannot fly off. The diameter is 14" and the shaft hole is $\frac{1}{4}$ ". This propeller is designed for gas engines of 1/6 to 1/4 H. P. and may be adjusted when on the motor.

For rush orders send to us now if your dealer does not carry them.

HOWES PROPELLER CO.
Fairview Ave., Stamford, Conn.

to the Nationals and worked out exceedingly well. Mr. Arthur Vhay was a great help in organizing the system by means of which records of the flights were kept.

Picture No. 17 shows a tense moment in the life of any gas modelist: "Will she or won't she?" is the question here. We know that it did—go up.

1938 Junior Air Races

Edward L. Semler of 1255 Collinwood Avenue, Akron, Ohio, has been kind enough to send us a report and some pictures of this year's Junior Air Races, held in this city recently.

Almost within the shadow of the huge Goodyear Zeppelin Dock on the spacious Akron, Ohio, airport, model ships representing the entire nation battled for supremacy during four days of stiff competition.

Seven big events were scheduled on the program, with a total of \$2500.00 in trophies, cash and model supplies. Tuesday, August 30, the Goodyear, Vincent Bendix and Peerless trophies were offered. Wednesday, August 31, the United Airlines, the B. F. Goodrich and the Aero-Industries Technical Institute trophies were offered. On Thursday, September 1, the Thompson Junior Speed, the L. W. Greve original design, the Sperry and the "Men with Wings" events were held. On Friday, September 2, the Stinson and the Texaco gasoline powered events were held. The Grand Prize was a week's trip to Hollywood by the United Air Lines Mainliner.

The meet was recognized by the public

on August 28, when Aviation Day attracted the largest crowd ever to attend the Akron airport. Before this huge crowd, and surrounded by an armada of real ships, a number of gas model constructors launched their ships in a successful efficiency demonstration.

The Junior Air Race contestants were then treated to thrilling stunts by navy ships from Grosse Ile, Michigan, to precision stunts by Lieutenant Joe Mackey, who later distinguished himself on September 5 during the Thompson Trophy race, to an 8,000 foot batwing jump by Merle Auken and by the aerial bombing of a fort by Major Al Williams.

Tuesday, July 30, delayed the race with rain and a high wind. Later in the afternoon, the sun blazed and the wind receded to a gentle breeze to permit a few entrants to place in the cabin model events.

Wednesday, July 31, offered a warm sun and a medium breeze for the completion of the cabin model events.

Anthony Kazloukas of Akron, sent his streamlined rubber-band-powered cabin model on a 22:56 2-5 minute flight and to victory in the Senior Class. His prize consisted of the Peerless Trophy, \$15.00 in cash, a reserved seat ticket to the Cleveland National Air Races and a wrist watch. Ted Just, of Johnstown, Pa., won second place with a flight of 15:24.

Robert Pfeifer of Cleveland, won the coveted Vincent Bendix trophy, the \$15.00 prize and the reserved Air Race ticket of the Junior Class, with a flight of 3:37 1-5 minutes. William Kalman, of Akron, came in second with 3:12.

Mike Karlack won the Open Class with a flight time of 11:21 3-5, to receive the B. F. Goodrich Trophy, \$15.00 cash and a ticket to the Air Races. Arthur Ech, of Johnstown, Pa., placed second with a flight of 11:3.

Thursday, September 1, brought a stiffer breeze and a pleasant sun, and saw the speed event ships flash down the 176 foot course at a speed of 60.2 m.p.h. Jerry Kolb of Cleveland, Edward Smith of Pittsburgh and Richard Korda of Cleveland, each flew their ships at 60.2 m.p.h. and drew lots for the trophy and divided the prize money evenly among themselves. The winner of the 1937 event attained an average speed of 75 m.p.h.

Tasso Pappas of Akron designed a helicopter model, which he refers to as his "gyrocopter tower," and took first place in the original design contest. This helicopter has four blades, with a rubber-band-motor and prop on the first and the third blade. The fuselage is vertical, resembling a tower. Ray Campbell of Cleveland took second place with his model which featured increased take-off speed by means of auxiliary wing tips which could be lengthened or shortened.

Don Kowalick of Rockford, Ill., won first place in the Junior Class of the Outdoor Stick Event with a flight time of 4:24. Edward Smith of Washington, Pa., took first place in the Senior Class with the time of 11:57. Leonard Becker of Lakewood, Ohio, won first place in the Open Class with a flight of 6:19 4-5.

Nineteen models competed in the finest concentration of exhibition scale models ever assembled in Akron. After four

**For Christmas—REGINALD DENNY SENDS YOU BEST WISHES
AND BRINGS YOU NEW ADDITIONS TO HIS FAMOUS LINE
FOR 1939!**

**A BRAND NEW SPORT IN GAS MODELS! The Denny Industries
have been appointed exclusive distributors for the
STRAIGHTAWAY KING GAS MODEL RACE CAR**

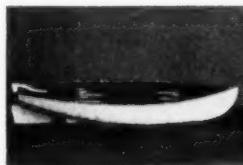


21" OVERALL. OWNERS REPORT 45 M.P.H.

Complete kit. Consists of drilled steel frame, cutout metal body, 4 wheels with rubber tires, formed axles, springs, and tie rods. Also has motor mounts, exhaust pipe, upholstery, gears, chain drive, flywheel, etc. Can be assembled in two hours. Powered with any 1/5 h.p. motor.

Kit, less motor \$10.00 When purchased with Denny motor..... \$9.25

ALSO ANNOUNCING—THE DENNYETTES



WHALER



SLAVE PRIVATEER



SUBMARINE



TRAMP STEAMER



HARBOR TUG

Five new kits to add to the Denny line. Beautiful little miniatures of authentic ships—just what you have always wanted. Six inch models in complete detail. Kits consist of all materials, printed hull, Berryloid Speedline Enamel, lills, fittings, etc. **35c each**

NEW 1939 EDITION OF THE DENNY JR. A famous airplane with the newest improvements. Longer moment arm, more stability, faster climb. No increase in price. Standard, complete with wheels, covering, etc. **\$9.50**

Deluxe with finished metal parts, 4½" airwheels, etc. **\$12.50**

Denny Streamline Airwheels complete with inflator. 2½ inch—\$1.25. 3½ inch—\$1.50. 4½ inch—\$1.75.

Have you noticed the consistency with which the **AIRSTREAM DENNYMITE** is winning the big contests? Power your plane with this fine motor and be "in the money" too.

DELUXE, with long exhaust, special choke, dural mounts, etc. **\$17.85**

STANDARD, same except for exhaust, choke and motor mounts. **\$15.85**

UNIT, without coil and condenser but the same fine motor. **\$13.85**

REGINALD DENNY INDUSTRIES, Inc.

5751 Hollywood Boulevard,

Hollywood, California

hours deliberation, the judges awarded first prize to Peter Zaleski of Cleveland. Second place was awarded to Max Sokol of Hamtramck, Michigan.

The meet featured a radio-controlled plane, entered by Walter and William Good of Kalamazoo, Michigan. This beautiful model, painted yellow, is capable of flying at the rate of 10 m.p.h., but was grounded by a persistent wind of greater speed. The model has an eight foot wing spread, is technically correct in every minute detail, and is controlled in the air by means of a radio set which regulates the ship's rudder.

Friday, September 2, provided pleasant weather but a changeable wind, necessitating constant surveillance of the wind direction. The staccato barking of the tiny power plants accompanied the opening of the gas model events. For six hours the large models climbed from the board runways, motors sobbing as they fought for altitude before their meager supply of "soup" gave out. Ships banked

and glided overhead in both official and test flights. Carroll Krupp sent his unique balsam-panelled-fuselage model aloft on its trial and official flight all in one. He barely finished the model in time for the race. The model features a single wheel and a one-bladed propeller. Robert Besse appeared on the field with a nine pound sensational low-wing monoplane that caught the admiration of the spectators. Unfortunately, it nosed down from a three foot altitude on its trial flight. Mr. Besse viewed this experiment with favor, and discounted the mishap, believing that the demonstration and experience was worthy of his efforts.

Walter Good of Kalamazoo, Mich., won first place in the Open Class with the flight time of 24:4 1-5. Carl Goldberg of Chicago, took second place with a flight of 8:15 3-5. Jack Deitz of Cincinnati, Ohio, won first place in the Senior Class, with a flight time of 16:48. Robert Hoffmeyer of Akron, came in second with 4:12 3-5.

William Good of Kalamazoo, Mich., became King of the Air Races upon the award of the contest Grand Prize—a week's trip to Hollywood, Calif., on a United Airlines "sleeper plane."

Picture No. 18 shows Bud Chapman, who came all the way from California, ready to release his ship for a take off.

In picture No. 19 Carroll Krupp of Akron is shown holding his single wheel, one-bladed propeller gas job.

In picture No. 20 Major Alford Williams, Walter Good and Bud Chapman examine one of the winning models.

California

Irish Truelson, secretary of the Gas Model Airplane Association of Southern California Inc., writes, telling us of the activities of this club. He says:

"We held another club contest Sept. 25, the so-called 'precision' type. Precision if you win and tough luck if you don't. Jim Williams won first place with his

a new streamlined sensation - - the Lancer*Thunder Birds Win 1st-2nd-3rd-4th-5th In Recent Meets*

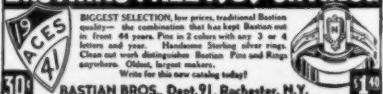
"45" wins 2nd competing against 60 large jobs. Time 3 min. 1 sec. 1/2 sec. faster than last year. Complete "45" kit includes cut out ribs and formers, shaped trailing edges, prop blank, full size plans, cement, dope, air wheels, etc. \$2.95 p.p. With colored dope and a finished prop (state size) \$3.50 p.p.

Complete "6" kit includes cut out ribs and formers, shaped trailing edges, prop blank, cement, dope, streamlined air wheels, etc. \$4.95 p.p. With colored dopes and finished prop (state size) \$5.95 p.p. Weight with motor 20 oz.

Catalog free on request

Describes recommended motors and accessories for these models

NEW CYCLONE AIRCRAFT CO. (Dept. A4) 166 Richards St., Brooklyn, N.Y.

300 PINS AND RINGS SHOWN IN BASTIAN'S FREE 1939 CATALOG**PARAMOUNT Quality Supplies**

Only the finest tested materials are sold by PARAMOUNT. It is our desire to make a friend of every customer. We invite YOU to be one of our SATISFIED friends. We guarantee highest quality at bargain prices.

The Double Value Line

STRAIGHT GRAIN	BEST GRADE, COLORED
Picked for gas model	use
5 ft. Balas	8c
1 1/2 x 1/4... 2 for	8c
1 1/2 x 1/2... 3 for	12c
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lack of it. Its span is about 5-3/8 inches and it flies about forty feet; on many occasions taking off from a small table. It may be conveniently packed into a box which will fit into a trouser pocket. The whole ship is made of note-paper except for the wooden propeller nose, propeller and wheels. You will note that it is resting on a small match box, which will help give you an idea of its actual size.

Mr. C. S. Rushbrooke of 14 Ennerdale Drive, Ashton-on-Mersey, Sale, Cheshire, England, who is undoubtedly familiar to many of our readers, writes and tells us some of the news of the Lancashire Model Aircraft Society of which he is Hon. Secretary and Treasurer. He says:

"There has been great activity in this club, and once again we won the National Inter-club Shield; the only club so far to hold this trophy twice. The club also won the National Gliding Cup, breaking the existing record at the same time with a flight of two minutes, twenty-three seconds out of sight, catapult launch. Records over here suffer in comparison with American times; owing largely to the fact that we still are not allowed to follow the model."

Picture No. 10 shows a group of the club members with some of their ships. Mr. Rushbrooke further says that he is looking forward to seeing more American model builders at the Wakefield contest. In this he is very optimistic, inasmuch as he infers that the Wakefield Cup will continue to reside in Europe. Now that he is in America, we have hopes of seeing Mr. Rushbrooke here in 1939.

New Zealand

William C. Munro of 174 Ythar Street, New Zealand, sends us picture No. 11, showing a group of members of the Southland Model Aero Club. It is evident that they go in for model aviation from "soup to nuts." In the picture members exhibit nearly every possible type of model; from small rubber models to a seven foot gas job. The club captain is Mr. A. Robinson who is on the extreme right. Mr. Munro is shown second from the left, standing. This club enjoys the distinction of being the model club which is farther south than any other club in the world; and they hold the New Zealand outdoor fuselage record of fifteen minutes, fifteen seconds. Some of the older members have turned to gas models and six motors are now on order.

There has been considerable controversy between Gordon P. S. Smith of Brougham Street, New Plymouth, New Zealand, and several aviation fans of New Zealand concerning the reason for New Zealand buying planes from the United States rather than Great Britain. Mr. Smith wants to know why the airways of New Zealand have gone so far ahead since the ban against the purchase of foreign planes has been lifted and American planes have been bought by New Zealand air lines. He wants to know, also, why Australia uses all American transports if British transports are best. He sends us the following clipping from one of the local New Zealand papers, which helps substantiate his contention. It reads:

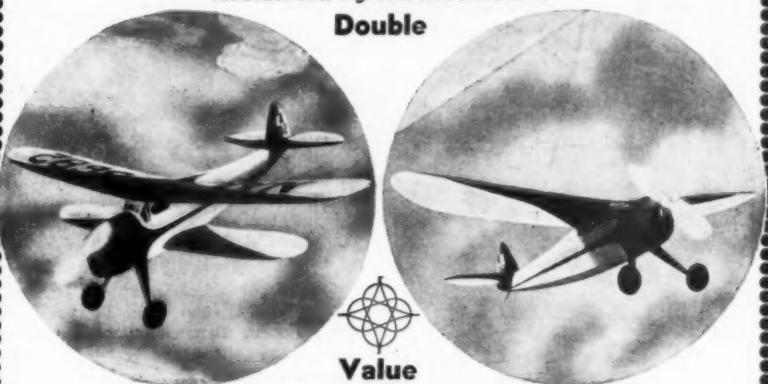
"The criticism here about Australia's purchase of American aeroplanes for long-distance commercial services is recalled by

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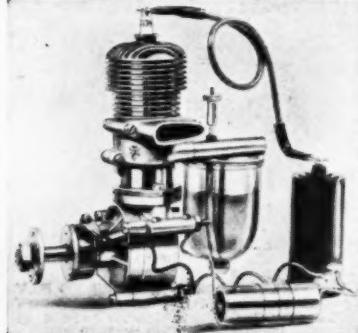
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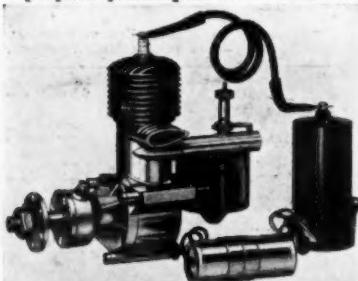
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the decision of British Airways Services to acquire four Lockheed aeroplanes from the United States costing \$70,000 for the London-West Africa route.

"It was stated a few years ago that Australis should have purchased British machines despite the fact that a type suitable for long distances was not manufactured, but vindication of the Commonwealth's policy appeared in the Cadman report admitting the non-existence of long-distance British commercial aircraft.

"An announcement in connection with Britain's purchase says: 'It is not policy to purchase foreign aircraft, but the only alternative is postponement of the development of routes exploited by foreign companies.'

Belgium

One of our oldest foreign readers is Mr. Alfred Van Wymersch of 14 rue Berkenlael, Forest, Brussels, Belgium; his remarks have been gracing the pages of MODEL AIRPLANE NEWS for the past six years. This year he entered the Wakefield Competition in France and had what was considered to be the most beautiful model in the contest. This is shown in picture No. 12, and has a beautifully "streamed" monocoque body with a one-bladed propeller. The wings are in two parts, fastened on with shear pins. Mr. Van Wymersch has worked out an automatic down thrust which he believes is an original idea. After the initial burst of power is gone the down thrust is reduced. In this manner the tendency to stall is corrected; the amount of correction being reduced as the motor unwinds, and the power grows less. This ship won third place among the Wakefield contestants and it makes regular, consistent flights of over three minutes in calm, dull weather. Readers may look forward to seeing plans of this ship in an early coming issue of this magazine.

Canada

Mr. W. W. Ireland of 10576, 112 Street, Edmonton, Alberta, Canada, writes and tells us something of the history of model aviation in Edmonton. He says:

"Edmonton, Alberta, has the possibility of being one of, if not the, biggest airports in the world; though to date you have not heard much of model activities. On March 24th, 1938, a group of gentlemen, known as the Model Aircraft League of Alberta during the years of 1926 to 1931, reorganized with the object of conducting contests.

"The new organization elected me secretary-treasurer, and a meeting of all boys interested in model building and flying was immediately held. Sixty-five boys and ten parents attended; and nine new clubs were started.

"One club which has been established since November, 1936—the Alberta Model Flyers—has sixteen gas powered models; one member having three gas models but only one engine. We know it will take a 'go ahead' club to beat this, and we are all working to this end. From time to time we will keep you informed of our activities."

France

The 16th International Air Show, which is to be held at the Grand Palais des Champs-Elysees, Paris, France, has been definitely scheduled for November 18th to

DEALERS! CLUBS!

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One Dozen (Assorted)

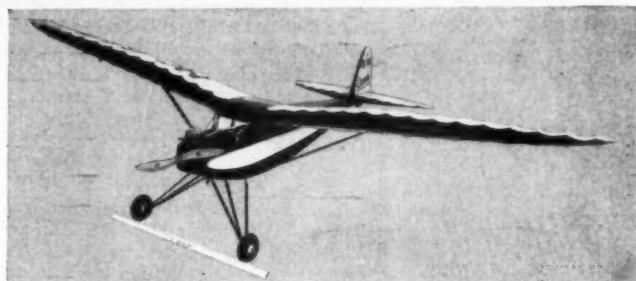
15" FLYING KITS

Valued at \$1.20

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WITH EVERY ORDER**

Balsa Wood For 36" lengths, double cost of 18" size.	1/16 x 12" 2 Doz.18 1/8 x 12"23	Regular Size, 2 Doz.50 WASHERS Small or Large 10008
Wood Strips Per 200	3/16 x 36" 1 Doz.35	JAP. TISSUE 20x24" Per Doz. White12 Colored15 Silver36
1/16 sq.08 1/16 x 12"27 3/32 sq.25 1/16 x 12"27 1/8 x 12"55 3/16 sq.50 1/4" for.50	5" Doz.30 6" Doz.38 8" Doz.58 10" Doz.75 12" Doz.90	BALSA CARVED PROPS 1/16 sq.15 1/8 x 12"35 1/4" for.50
1/4" for.50	10" for.40	PAULOWNIA WOOD HAND- CARVED PROPS 1/16" for.25
40 for.50	12" for.50	225 ft.50
1/16" for.50	18" for.50	3/16" for.60
16" Sheets Per 20	24" for.50	225 ft.60
1/16 x 2"15 1/16 x 3"18 1/16 x 4"20 3/32 x 3"22 1/8 x 2"23 1/8 x 3"26 1/8 x 4"32 1/4 x 3"34 1/4 x 4"38 1/2" for.75	5" 6 for.25 6" 6 for.30 8" 6 for.45 10" 6 for.50	RUBBER REGULAR RUBBER 1/16" for.15 1/8 x 12"35 1/4" for.50
1/16 x 2"15	12" 6 for.50	1/16" for.15
1/16 x 3"18	15" 6 for.50	1/8" for.25
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1 x 12" each.		

Radio Control!



The "Oriole" Prefabricated Gas Model

Consider its possibilities and the broad field for experimentation. We have just the plane and power plant complete expressly for this purpose, ideal for photography, etc.

ANNOUNCING with the same complete "ORIOLE" prefabricated kit including new improved shock absorbing landing gear, detachable externally by merely releasing two hooks and removing three bolts, our new (interchangeable) high lift gull wings and the "MERCURY" engine incorporating all the power, performance, light-weight, quality and durability that can be desired.

For the discriminating model builder who wants and expects results at lowest cost without patient taxying labor. A plane and engine complete giving exceptional excellent performance and durability enabling you to proceed with utmost confidence to make desired installations.

PRICES F. O. B.—ORIOLE prefabricated kit with regular (optional) or new high lift gull wings. Span 10 ft. 7 in. Length 75 in. Height 20 $\frac{1}{2}$ in. Weight complete including 4 $\frac{1}{2}$ in. M & M wheels ready to fly, 11 lbs. 12 $\frac{1}{2}$ oz. \$21.50
Dry Kit, less wheels, dope and cement. 14.75
MERCURY ENGINE less propeller. 25.00
Special recommended propeller. 3.50

Send for particulars

AVION MODEL AIRCRAFT MFG. CO.
P. O. Box 906

Woonsocket, R. I.

something of the activities of this new organization. He says:

"The Tri-State Model Association was formed last February by four men for the purpose of staging model airplane contests and to further the building of models in the Tri-State area. It is not a profit-making association in itself, but it has helped the manufacturers and dealers of model supplies. The pamphlet idea for obtaining prizes is a good one but a little more expensive than we anticipated. Our next one will probably have a small charge to the advertisers in addition to the prize contributed, as our expenses exceeded our income on the last contest. All of the pamphlets handed out at our contest were taken home as there were none picked up off the field after the contest, a condition highly pleasing to us."

"The Association has to depend on the dealers to donate the prizes and so far they have co-operated sufficiently to pay us for our efforts of boosting their business. Our expenses are met by charging an entry fee to the contests. A person upon entering a contest becomes a member automatically, and at present we have approximately one hundred members."

"Three contests have been staged this year, and all three states were represented by contestants. The contest rules and regulations conform with N.A.A. specifications and sanctions were obtained in order to allow the contestants the opportunity of trying for world record flights."

We hear from many localities that this association is doing excellent work and

gives promise of being one of the strongest in the country in a short time.

Lebanon, Pa.

The sixth annual model airplane contest of the Lebanon Model Airplane Club was held on Saturday, August 27th, under N.A.A. sanction. It was sponsored by the Exchange Club of Lebanon and held at Horst Field, Lebanon, Pa. It appears that the prizes were "a lot of boloney"; for each of the eighty-six entered contestants received, as a souvenir, one and a quarter pounds of Lebanon bologna. Unfortunately there were a few accidents. Lew Kiefer, a judge, was slightly hurt on the chin when struck by a rubber driven model and a first aid attendant suffered a slight injury when struck in the back by a gas model. Winners in the various events were:

Power Models: Robert Jacobson, Philadelphia, first with a time of 7 minutes, 39 seconds. Baltimore, Md. (no name given), second with 7 minutes, 36.4 seconds. Fuselage models: First: Robert Gable, Reading, Pa., with 5 minutes, 54.2 seconds; Second: Ted Just, Johnstown, Pa., with 4 minutes, 58.6 seconds. Stick Models: First: Salem Barrack, Harrisburg, Pa., 4 minutes, 47.8 seconds. Second: Fred Honeker, Reading, Pa., 4 minutes, 11.4 seconds. Glider Models: First: Stephen Kowalik, Wilmington, Del., 1 minute, 55.8 seconds. Second: Henry Struck, New York City, 1 minute, 46 seconds.

We are indebted to Harry E. Meyer of 612 Walnut Street, Lebanon, Pa., for this information.



The Mercury Engine

Engine Specifications: Material

Duralumin, high carbon steel, high speed bronze, precision ball-bearings, alloy pistons and special rings.

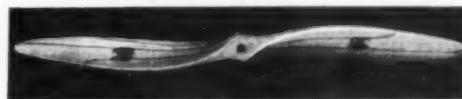
Weights

Engine with tank (separate to place near center of gravity) and 14 in. of neoprene fuel line, 1 lb. 5 $\frac{1}{4}$ oz. With propeller made to order 1 lb. 8 $\frac{1}{4}$ oz. Engine complete with coil and condenser 1 lb. 14 oz.

Powers

Bore and stroke 1 $\frac{1}{4}$ "x1 $\frac{1}{4}$ "—B.H.P. 0.7 at 3800 R.P.M. Traction with our propeller 8 lbs.

Note. This is according to dynamometer reaction tests.

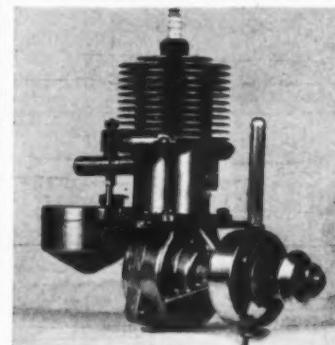


Avion Gas Model Prop

The correct propeller is essential to good performance.



You Need POWER . . .



now more than ever, to get your plane upstairs in minimum time. No other motor can give you the climb, none is more consistent, none more reliable.

Whether you are building a five foot racer or a ten foot radio controlled job "FORSTER" is the answer to your need for power.

The more experienced flyers are powering their ships and winning with "FORSTER" motors. No greater tribute could be paid their superiority. Ask the owners.

Assembled, tested, and run at the factory..... \$17.50

Enclose stamp for literature

FORSTER BROTHERS

519-521 Lake St. Maywood, Ill.

THE NEW HUSKY HAS EVERYTHING— Instant Starting—Abundance of Power—Idles Steady at 250 R.P.M.— Full Speed Up to 8000 R.P.M.—BUILT to LAST

THE LIGHTEST COMPLETE READY TO RUN GAS MOTOR ON THE MARKET

The New "Auto Type Snap Spark Ignition" Starts the "HUSKY" Right Now—This new feature does away with the breaking of the points which can be done in a few seconds. We guarantee the "Husky" to give you 100% satisfaction.

The NEW "HUSKY" runs equally as well Upright or Inverted and was Designed to Fly Model. Weighting from 1 oz. up to 31 oz. The "HUSKY" can run on any Speed up to 250 R.P.M. up to 8000 R.P.M. using either a 1 1/2" or 12" Prop. The NEW "HUSKY" BEAUTIFULLY FINISHED THROUGHOUT. Comes complete with WIRELESS, ANY SIZE BATTERY and push button motor is THOROUGHLY TESTED, RUN IN and FULLY GUARANTEED TO GIVE you Consistent Performance and LONG LIFE. 5 oz. weight. 1 oz. weight. Wt. ready to run \$4.50. Including two pencils for Current.

We are going to see to it that every HUSKY owner will be completely satisfied and a hundred per cent booster. You can't go wrong. ORDER YOUR HUSKY TODAY! IMMEDIATE DELIVERY.

Husky motor mounts, wt. 2 1/2 oz., per pr., postpaid.	Husky complete ready to run (less motor mounts, batteries and prop.)
Husky Non Brittle prop. 11" or 12" each, post-	batteries and prop.)
paid \$1.00	Postpaid \$12.50

If your dealers do not sell HUSKIES order direct from

HUSKY MINIATURE MOTOR CO.

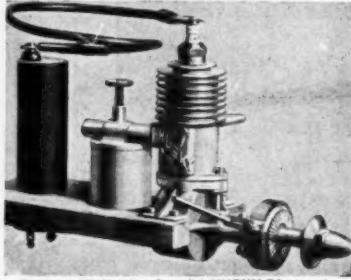
1400 North 45th Street, SEATTLE, WASH., U.S.A.



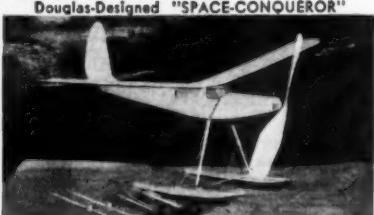
AERO GLIDE—Wingspan 41", length 30", wt. 3 oz. Kit contains all parts to assemble folding wings. **AMCO BALANCE KIT**—Wingspan 30", length 20", wt. 2.5 oz. special brown contest rubber motor, glue, dope, tissue, wing ribs and other parts printed on "Aero" sheet balsa—all strips and hardware included. \$3.00. **Auto-Glide**. "Aero-Glide" Kit complete \$2.25 Postpaid.

Bend Money Orders or CASH only. When sending cash fasten coins to letter with adhesive tape. If located in Washington add State Tax.

DOUGLAS MODEL AIRCRAFT CO.
1400 North 45th St., Dept. 12, SEATTLE, WASH., U.S.A.



Dealers Write for Special HUSKY Discounts



Douglas-Designed "SPACE-CONQUEROR"

Wing span 36", length 27", wt. 2.8 oz. The new "Space Conqueror" Hydroplane, Landplane and Skiplane—all in one model—change from one to the other in two minutes. This model has a smooth record of 10 miles in 500 ft. altitude with M & M Model Wheels. And two to three minutes with pontoons and skis. It takes off just like a real plane, is very easy to build, and the flights it makes are really amazing.

Complete Kit with M & M Model Wheels, \$1.75 P.P.

SEND FOR FREE CATALOG OF GAS AND RUBBER POWERED MODEL KITS AND SUPPLIES

SpeedWay

GRINDER \$5.95

DRILL \$7.95

Now REAL Quality Tools

Products of SpeedWay, leading manufacturers of electrical and hand tools. These tools are correctly designed, operate at most efficient speeds, and embody the feature, power and capacity of much more expensive tools. **DRILL**, 1000 RPM. **DRILL**, powered by genuine high torque SpeedWay Drill motor have die cast aluminum frames and weights 27.5 oz. **20,000 RPM HAND GRINDER**, new for more efficiency, weighs 11.5 oz. **Hand Grinder** and accessories in steel carrying case \$14.95. Also complete line of cutters, drivers, etc. Send for catalog or write for free circular. Dealer wanted.

SPEEDWAY MFG. CO.
1839 S. 52nd Ave., Cicero, Illinois



Colt single action army revolver FRONTIER model with machined cylinder, rod ejector and four and three quarter inch barrel.....\$1.45
Above with five and one-half inch barrel.....1.55
Above with seven and one-half inch barrel.....1.70

Half scale Thompson Sub Machine Gun model kit 1.00
Full scale Thompson Sub Machine Gun model kit 3.00

Full scale Colt cal. .45 automatic pistol kit.....1.00
Full scale Colt cal. .25 automatic pistol kit......50

Savage calibre .32 auto. pistol with mach. barrel .75
Luger 9 M/M auto. pistol w/4-in. mach. barrel 1.75
Same as above with six inch machined barrel.....1.90

These beautiful kits are complete in every detail and made of the best basswood. All parts are cut to shape and require only a short time to finish.

They are to be made for display purposes and you will be more than proud to show them to everyone. Postpaid in U.S.

Send for FREE illustrated circular
GUN MODEL CO., Dept. E-52, 2908 N. Nordica Ave., Chicago, Ill.

A 27 mile wind made flying difficult and caused numerous crack-ups. There were over 5,000 spectators at the Airport to witness this meet and the refueling of the State Fair Endurance plane. The entries surpassed that of the 1937 State Fair Meet and were as follows:

Stick Models.....64 Cabin Models68
Gas Event69 Scale Contest16

Mr. Harry C. Copeland was Contest Director.

Pittsburgh

The fifth WPA Scale Model Contest will be held on November 12th. Mr. Harry G. Vogler Jr. is the director of the aircraft division of this organization and will sponsor the event, which will be open to builders of the entire tri-state area. There will be two divisions, junior for those builders under sixteen, and senior for those over sixteen. Closing date of entries is November 9th at 9 p.m. Mr. Vogler may be reached at Boys Club of Pittsburgh, 4412 Butler Street, Pittsburgh, Pa.

Lakeland

A state-wide contest will be held at Lakeland, Florida, on Thanksgiving Day, November 24th. The meet will be conducted by the Lakeland High Model Club and will be sponsored by the Chamber of Commerce. Events will include glider, rubber powered and gas powered models. For entry blanks and further information contact Walter Seegmiller, 921 East Osceola Street, Lakeland, Florida.

Boston

The Junior Aviation League of Boston, Mass., will hold indoor contests this fall on November 19th, December 3rd and 17th, at the South Armory, Irving Street, Back Bay, Boston. Flying will continue from 9:30 a.m. to 12:30 p.m. For further details write Mr. A. Lewis, Jordan Marsh Company, Boston, Mass.

Syracuse

The results of the New York State Fair Model Airplane Contest, held at Syracuse Airport, New York, on September 4 under N.A.A. sanction, are now available. Sponsor of this event was the Syracuse Model Airplane Club. The events, and respective winners, were:

1. Roger Desbrosses

2 Larry Low

1. Robert Dillman

2. Kale Harden

1. Clement Buell

2. Raymond Darling

1. Donald H. Pratt

2. Patsy Fiumano

1. Patsy Fiumano

2. Edward Izzo

Senior High-Point Winner:

Kale Harden, Binghamton, N.Y., who received the Alex. Grant Trophy (1 year)

Junior High-Point Winner:

Patsy Fiumano, Syracuse, N.Y., who receives the Edwards Aero Club Trophy for 1 year

1. Max Sokol

2. Chas. H. Hawley

1. William H. Lacey

2. Jack Daugard

Gas Model Event

New York City

New York City

3m 10.8 secs. Gold Trophy

2m 11.8 secs. Gold Trophy

Stick Event (Senior)

Syracuse, N.Y.

Binghamton, N.Y.

2m Silver Trophy

1m 51 secs. Silver Trophy

Cabin Model (Senior)

Binghamton, N.Y.

Utica, N.Y.

2m 5.6 secs. Gold Trophy

1m 55.2 secs. Gold Trophy

Stick Event (Junior)

Bainbridge, N.Y.

Syracuse, N.Y.

1m 17. secs. Silver Trophy

1m 7. secs. Medal

Cabin Model Event (Junior)

Syracuse, N.Y.

Syracuse, N.Y.

1m 22. secs. Gold Trophy

1m 40. secs. Medal

Exhibition Scale Contest (Senior)

Hamtramck, Mich.

(Stinson Reliant)

Syracuse, N.Y.

(Seversky P-35)

Silver Trophy, also Exchange

Trophy for 1 year

Medal

Exhibition Scale Contest (Junior)

Syracuse, N.Y.

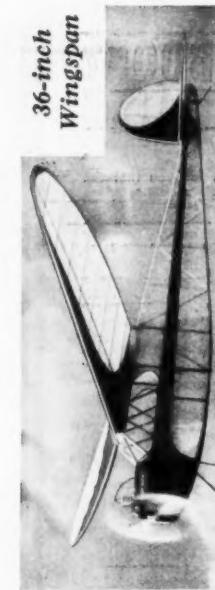
(Boeing P-26a)

Syracuse, N.Y.

(Super-Ace)

Plaque

Medal



Building and flying the Clipper Jr. gives you gas model fundamentals—parts receiving, building the Jr. before you tackle your first gas model. There has never been anything like it—and just look at what price—only \$1.00 complete!

Postage 15c; none if ordered from dealer.

COMET presents the **CLIPPER JUNIOR**

- Looks like a GAS MODEL
- Sounds like a GAS MODEL
- Flies like a GAS MODEL

COMET MODEL AIRPLANE & SUPPLY COMPANY
2059 W. Cermak Road, Chicago, Dept. MN12, Eastern Branch: 688 Bway., New York, N. Y.

Here's something new, different, sensational! The rubber-powered Comet Clipper, Jr., seated right down from the Comet Clipper, G.P. propeller, 36" elliptical wing, flat tail, 36" elliptical landing gear, high performance, kit contains limitation of motor, motor, propeller, wheels, controls, fuselage finished propeller, metal cylinder changes, sharply printed Bassie, plenty of rubber.

propeller being geared to one-half engine speed. The power output of the engine is the only factor to be concerned with in this case. The horsepower of the average common gas engine of the type used in model planes may be determined by the following formula:

$$H.P. = (0.0000833) Cu (R.P.M.)$$

Thus we see that if a motor develops 1/5 horsepower at 10,000 R.P.M., the cubic inch displacement of the piston, (Cu) may be determined readily by solving the formula as follows:

$$0.2 = (0.0000833) Cu (1000),$$

$$\text{or } Cu = \frac{0.2}{0.833} = 0.24 \text{ cubic inches.}$$

The value of (Cu) for the normal 1/5 hp. motor at 4000 R.P.M. is 0.6 cubic inches. If a motor of this cubic inch displacement develops its maximum power at 8000 R.P.M., the power at this speed will be 2/5 hp. = (0.4) hp. It may be seen from this that the cubic inch displacement of the piston (Cu) is not an indication of the horsepower developed by the motor.

Therefore the propeller should be designed to absorb the horsepower of the engine when it is turning at its normal running speed and the propeller is revolving at the speed at which the correct pitch for the plane's speed was determined. If the propeller is mounted directly on the motor shaft, which is normal practice, the engine and propeller speed will be the same. Then the engine horsepower and the propeller's pitch, diameter and blade width should be calculated at the same (R.P.M.). However if the engine and propeller run at different speeds the engine power should be calculated at its running speed and the propeller at its speed of rotation.

If the required propeller pitch, cubic inch piston displacement, engine speed and propeller speed is known, the other characteristics of the propeller (diameter and blade width) may be determined by means of a formula. This shows also the mathematical relationship existing between all the quantities involved. It may be applied whether or not the propeller and engine speeds are the same. It is as follows:

$$Cu (V_m) = (0.000000305)^2 (V_p)^4 P^2 D^3.$$

In the formula: Cu = the piston displacement in cubic inches; V_m = the engine revolutions per minute when developing its maximum power; V_p = the propeller revolutions per minute when the engine is turning at V_m; P = the propeller pitch required; W_n = the blade width necessary and D = the diameter of the propeller.

Now suppose we take a practical problem as an example. A plane is being designed which will have a flying speed of twenty miles per hour. The motor has a piston displacement of 0.6 cubic inches and its normal running speed (V_m) is 4000 R.P.M. The motor may develop more power at a higher speed, but it must be remembered that the efficiency of propellers at speeds over 6000 R.P.M. is very low. If a high engine speed and a low propeller speed is desired, gears may be used to obtain the proper speed ratio.

CLASSIFIED DIRECTORY

Advertise in this directory for quick profitable results! Rate 10¢ per word. Minimum 20 words. REMITTANCES MUST ACCOMPANY ALL ADS FOR THIS DIRECTORY. Advertisements for the January issue must be in by November 10.

MODEL AIRPLANES-KITS-SUPPLIES

127 120 116 films enlarged 4x6 35¢ complete. Send for price list and specimens on film and supplies. Star Photo, New Britain, Connecticut.

BROWN AERO RUBBER—Hodgman Rubber Company, 261 Fifth Avenue, New York City. Chicago office: 412 South Wells Street. Dealers and manufacturers only.

SPECIAL—Clear gas model dope and cement, pt. 40c, qt. 65c. Gumwood gas props, 12, 13, 14, 15" plain 30c, varnished 50c. Free catalog. Wilmer Model Aircraft Co., Wilson Ave., Frederick, Md.

DEALERS, Jobbers! Real profits on model supplies. Stamp brings new wholesale list. Modelers write for free retail list. Waterbury Model Builders Supply, 131 Cherry St., Waterbury, Conn.

ATTENTION gas and scale model builders. Send for amazing price list dealing with new line of metal parts and supplies. Pentiment Model Specialties, 284 St. Ann's Ave., Bronx, N. Y.

BARGAINS! Gas model kits, motors, supplies. Special prices. Send now for new free catalogue. Hornet Model Airplane Company, Selma, California.

KWIK-STICK—Special gas model cement. Adds pleasure to model building. ½ pt. 35c, 1 pt. 65c. Largest variety gas kits and motors in Brooklyn. Motor mechanic on premises. Photo supplies. You-Zah's, 2182 Flatbush Ave., Brooklyn, N. Y.

READYBUILT 21" span, new design flying stick monoplanes. 75c postpaid in U.S.A. L. M. Davis, 621 Gandy St., Denison, Texas.

ANNOUNCING the opening of a new model airplane supply store, handling complete line of model supplies. Quality balsa, spruce, props, fittings, etc. 2 Knowlton St., Bridgeport, Conn.

GAS Models. Super-Buccaneer (Brown). \$45.00; \$25 (Cyclone) \$45.00. Test hopped. See November "Gas Lines" F.O.B. Art Kronfelt, 430 Commons St., Belmont, Mass.

DEALERS—Clubs—Get our discounts today. Modelers—Our complete gas model catalogue is free. G.M.S., 313M Second St., New York, Syracuse, N. Y.

SENSATIONALidget race kit complete in every detail, nothing extra to buy. Beautiful thin quarter inch scale model sent postpaid, only 75c. Modern Model Makers, Inc., 5539 West Adams Blvd., Los Angeles, Calif.

TIMER—Amazing new dependable timer. Adjustable to 10 to 60. Weight 1 oz. 75c. M. Marian, 1918 W. 3rd St., Hastings, Neb.

CANADIAN GAS MOTORS, ½ h.p., 6% off. Original features. Send addressed envelope for information. Drimble, 193 Gainsborough Road, Toronto, Canada.

FREE price list covers gas and rubber supplies and kits. Northern builders—get orders in two days. Capital City Model Shop, 71 E. Arch at Jackson, St. Paul, Minn.

SPECIAL Experimenters Prices—Forster Motor \$17.75, Berkley Cavalier \$15.00, both for \$30.00. Raytheon Radio, Tuba, designed for Radio Control \$3.50. Signal Relay \$4.95. All recommended for Radio Control by leading authorities. Send for free booklet on Radio Control and Model Supplies. Radio Aircraft Company, 189 Utica Avenue, Brooklyn, N. Y.

FREE Christmas Offer: Print name and address on post card and mail to H & F Model Airplane Co., 459 Bristol Street, Brooklyn, N. Y.

DEALERS—We carry the following national advertised lines: Burd, Comet, Continental, Cleveland, Ideal, J. L. Wright, Airway, International, Construct-A-Plane, over 500 different kits. Also gas motors, supplies, etc. Send for price list. New England Model Airplane Distributing Co., 66 N. Washington St., Boston, Mass.

FREE—2 sheets tissue with price list. Includes supplies, kits and engines. Northwest builders—our central location saves you two or more days on delivery. Capital City Model Shop, 71 E. Arch at Jackson, St. Paul, Minn.

DEALERS, Clubs, Schools: Send for low, complete wholesale list, including gas model supplies. Save money. Model Airplane Utility, 5307 New Utrecht Ave., Brooklyn, N. Y.

(The author strongly advises that such a system be used if high efficiency and best results are urgent.) In this case the propeller will turn at engine speed, it being mounted directly on the shaft. Therefore V_p is 4000 R.P.M.

Under these conditions the correct pitch may be obtained from the chart or it may be calculated by the following formula:

$$P = 1600 \left(\frac{V_A}{V_p} \right).$$

In the formula: P = the propeller pitch in inches; V_A = the speed of the airplane in miles per hour, and V_p = the velocity of the propeller in revolutions per minute. It is solved as follows:

$$P = 1600 \left(\frac{20}{4000} \right) = 8 \text{ inches.}$$

Thus the pitch should be eight inches, under these conditions.

At this juncture the most efficient blade width should be decided upon. A width equal to one-tenth the diameter ($D/10$) will be very efficient, so this value is selected. When the known numerical values are inserted in the formula; it may be solved for (D), the remaining unknown value, as follows:

$$(0.6) (4000) = (0.000000305)^2 (64,000,000) \text{ times } (8) D/10 (D)^2,$$

simplifying —

$$0.6 = (0.000000305)^2 (12,800,000) D^4, \text{ or}$$

$$(0.6) = (0.000000000093) (12,800,000) D^4, \text{ or } D^4 = \frac{0.6}{(0.000000093) (128)} = \frac{0.6}{(0.0000119)}$$

$$\text{Then: } D = \sqrt[4]{50,400} = \sqrt[4]{224.3},$$

or, $D = 15$ inches. (Diameter of the propeller).

The blade width now may be found:

$$W_n = D/10 = 15/10 = 1.5 \text{ inches (Blade width).}$$

The propeller for the plane specified, then, should have a pitch of eight inches, a diameter of fifteen inches and a blade width of 1.5 inches.

The reader may say to himself: "This is very fine, but—how do I make a propeller to these specifications?" How this may be accomplished will be shown in the next article, to appear in the January, 1939, issue of MODEL AIRPLANE NEWS.

Correction

In the last issue of this magazine, November 1938, a typographical error was made in the table appearing on page 17, in the column "Camber Factor." The decimal point was to the right of the first zero. This is misplaced—it should be to the left of the first zero. In other words; the first camber factor for the Grant X should read (.0885).

Gas Lines

(Continued from page 62)

W. E. Marienscheck. The contest was officially sanctioned by the National Aeronautic Association.

"Although the weather was not very favorable, there were ninety-five entries from all parts of the east, making the meet very successful. In addition to a beautiful fifteen-inch trophy which was donated by the members of the Queen City Club, there was \$75.00 worth of model supplies donated by manufacturers, and awarded as prizes.

N.A.A. Youth Memberships Nearing 5000 Mark

N.A.A. Junior and Gas Model Memberships have increased over 300% since January 1st! A report on Youth Division activity covering the first eight months of the year shows that Youth Membership stood at approximately 1500 on January 1st, and 4782 on September 1st. Of the September 1st total, 2507 were re-

SCIENTIFIC

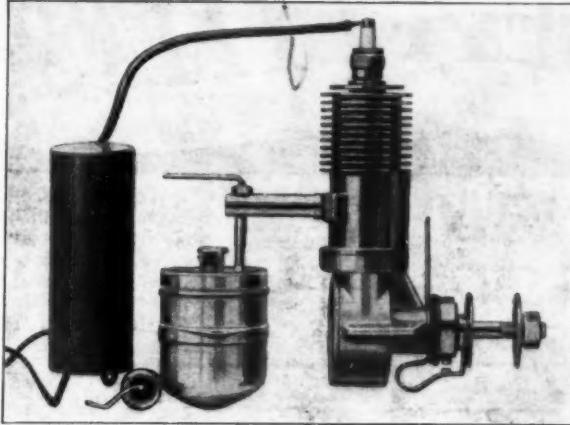
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TRIBUTOR FOR NEW MODEL D

BROWN JR. ENGINE

AT \$10.
ONLY POSTPAID

Complete, Ready
to Run
Immediate De-
livery

SPECIFICATIONS
7" Bore, 1" stroke; 1,200-
10,000 R.P.M., Height 4 1/4",
1/2th Horsepower.
Actual scale weights: Bare
motor 1 1/2 oz.
Complete with fuel tank,
and condenser (as furnished)
..... 11 1/2 oz.
Ready to run, with gas, two
batteries, and propeller...
20 1/2 oz.
Two Standard 1 1/2 volt flash
light cells required for cur-
rent.



**THE New Improved 1939 Model "D" has everything, power, speed, stamina, and sound engineering advances, in every respect, lined up with the famous Brown motors that have won first place and right awards everywhere. The same high quality metals are used, such as alloy steel cylinder, with aluminum alloy piston and 2 special rings. Forged aluminum connecting rod, polished steel magneto, and other high quality features. Order early from Scientific for immediate delivery. COMPLETE ENGINE KIT TO RUN YOUR OWN MODEL PLANE AND COIL, CON-
DENSER, ETC., FOR ONLY \$10.00. POSTPAID.**

Included at no additional cost is a motor manual containing all information on the operation and care of your engine. This manual is included with all Brown Jr. engines.

SCIENTIFIC MODEL AIRPLANE CO.

218-220 MA-12 Market St., Newark, New Jersey

In France: E. Kruger & Co., 9 Rue St., Sebastian, Paris.
In England: H. & S. Norman, 48 Derby Rd., Kirkham.
In Australia: Swift Model Aircraft, 159 Adelaide St., Brisbane, Queensland.
In South Africa: Stratosphere Model Aircraft Supplies, P. O. Box 3248, Johannesburg.

ported as Gas Model Members under the new licensing system inaugurated this spring.

Minneapolis

Richard W. Billett of 2548 Nicollet Avenue, Minneapolis, Minn., sends us the following report of the Northwest Model Air Meet, held on September 25th at the Cedar Airport, Minneapolis. Winner of the gas model event was Robert Toft, 18, 3128 East 36th Street, Minneapolis. The report follows:

"The contest drew over 200 entries throughout the northwest, and the number of spectators was conservatively estimated at 15,000. All in all it was very successful from a standpoint of attendance.

"A rather brisk breeze, lasting all day, didn't permit much in the way of good time and the fatalities amongst the gas jobs, particularly, was terrific. In spite of these handicaps though, the winning times in each event were better than average. Many flights of interest to both contestants and spectators were made.

"From the experience gained at this, our first meet of any consequence, we feel assured that we can promise one of the biggest and finest meets in the country for next fall. This meet was put on in four weeks time.

Anyone who is interested in entering future contests in the vicinity of Minneapolis should contact Mr. R. W. Billett.

OTHER BROWN JR. ENGINES



MODEL C
Offers the proven
advantages of the
Brown Jr. motor
at a medium
price. Complete,
ready to run.

\$17.00
Postpaid

MODEL B
Long famous for
its power, smooth
running, and high
compression. Com-
plete, ready to run.

\$21.50
Postpaid

**MODEL M
MARINE**
Built to high ex-
acting standards
for use in model
boats. Complete,
ready to run.

\$15.00
Postpaid

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BIG PAY GOOD FUTURE
If you are interested in training yourself
for a highly paid position in the aviation
industry — write, immediately,
including stamp.

Mechanix Universal Aviation Service Co.
Wayne County Airport, Box 857, Dept. I, Detroit, Mich.

QUIT STALLING

and get the best results from your engine
by the use of a

SMITH IGNITION COIL

The quality of our coils remains long after
the price is forgotten. For this reason we point
with pride to just a few of the many contests
that have been won with the use of our ignition
equipment—

1st German Nationals
1st Russian Nationals
1st American
Nations

1st French Nationals
1st British Nationals
1st in local and State
contests too numer-
ous to mention.



LIGHTWEIGHT FIRECRACKER
Wt. 1 1/4 oz.
\$3.00
BIG-SHOT
Wt. 5 oz.
\$3.50
NATHAN R. SMITH MFG. CO.
1814 West 8th St., Los Angeles, Calif.

ANNIVERSARY SALE!

Naturally we are proud and happy! That's why we are throwing a Tenth Anniversary Party! We want our friends and customers to benefit with us. We are cutting loose with prices as never before—not on a few selected items—but, wherever possible, on **EVERY SINGLE SUPPLY ITEM, KIT OR MOTOR**. We are chopping prices with an axe! And on top of that—we give you **FREE PREMIUM GIFTS** with all your orders! Come on in and join the fun!

COMPLETE SELECTION OF MOTORS AT LOWEST PRICES!



STANDING IN BEAUTY AND PERFORMANCE

ALL KITS CONTAIN:

Complete materials to build the model; carved props; copyrighted plans; simplified instructions; printed balsa; cement, dope; colored paper; and extra stock of all parts. You've got a thrill coming when you build one of these planes.

5/8" Scale Model Flyers
 1. Monocoupe 50c each
 2. Waco 50c each
 3. Curtiss Seahawk 50c each
 4. Mister Mulligan 50c each
 5. Macchi-Castoldi 50c each
 6. Stinson 50c each

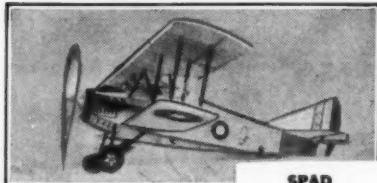


MACCHI-CASTOLDI

15" Inch FLYERS 10c Each



HELLDIVER



SPAD

MOTOR TRADE-IN OFFER: Send your motor or a full description for best appraisal offer.

DEALERS: Write on your letterhead for special wholesale prices on supplies, kits and specialties.

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Borres, Kullaga-

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ALUMINUM WHEELS	
1" per pr.	.08
1 1/2" per pr.	.15
2" per pr.	.20
3" per pr.	.30
all the same price	
1 oz. 10c; 2 oz. 15c	
3 oz. 25c	

PROPELLERS

PAULO	
Mach Cut	Wing
6"-5c	10c
7"-6c	15c
8"-7c	20c
9"-8c	30c
10"-9c	35c
11"-10c	45c
12"-11c	60c
13"-12c	

RUBBER

.045, 25 ft.	
1/16 sq.	.15
1/16 dia.	.15
Skin for	.50c
3/16, 10 ft.	.35c

WHEELS

1 dot. on 1/4"	
All com. white	.10c
dia.	
Superior white	.10c
dia.	

TISSUE, AA

.10c	
1/16 sq.	
1/16 dia.	
Skin for	
3/16 dia.	

CELLULOID MOTORS

.10c	
1/16" for	
2 1/2"-1 for	
2 1/2"-1 for	
3/16" dia. for	

CELLULOID MOTORS & COWLS, RING

.10c	
1 1/4" dia. 1 for	
2 1/2" dia. 1 for	
3 1/2" dia. 1 for	
Small, each	.10c
Large, each	.10c
per dia.	

THUST BEARINGS (Hard Steel)

.10c	
1/16" dia. 1 for	
2 1/2" dia. 1 for	
3 1/2" dia. 1 for	

ALUMINUM COWLING

Closed .05	
1 1/2" dia. 12	.12
1 1/2" dia. 15	.15
2 1/2" dia. 22	.22
2 1/2" dia. 25	.25
3 1/2" dia. 30	.30

OPEN ANTI-DROP

.05	
1 1/2" dia. 12	.12
1 1/2" dia. 15	.15
2 1/2" dia. 22	.22
2 1/2" dia. 25	.25
3 1/2" dia. 30	.30

PURSUITS OR SWIVEL MACHINE GUNS (Die Cast Gun)

.05	
1/4" pur. 1 for	
1/4" Lewis 1 for	
1/4" Lewis 1 for	
1/4" Lewis 1 for	

DIE CAST BOMBS

.05	
1 1/2" long-1 for	.25
2 1/2" long-1 for	.25
3 1/2" long-1 for	.25

DIE-CAST WEAPONS AND FAIRINGS

.05	
3 pc. to a set	
model-1 set	.75

\$1
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CAPITOL'S FAMOUS KITS \$1

Each one a giant in size and value; complete in every detail.

Guaranteed sensational flyers!

NEW!

FREE: A large Aluminum Cowling with cash kit!

CAPITOL'S DUPLEX. Material to build 2 PLANES for the price of one!! 48" wingspan . . . Bamboo paper for fuselage . . . Free Wheeling . . . Wire landing gear . . . Sp. Endurance Prop. . . Full size plans . . . detachable parts. etc.



STINSON SR9

CAPITOL'S BRAND NEW LINE

36" Wingspan—8" Aluminum Prop with every kit!

Newly developed and perfected; most complete and detailed models on the market at this price. Kits are 100% complete with many finished parts.

BOEING P-26 A **SEVERSKY ARMY TRAINER** **CURTISS ROBIN**

CESSNA AIR-MASTER **SUPER ENDURANCE**

CURTISS P-6 E

50c
each



Here's a Knockout

GIFT

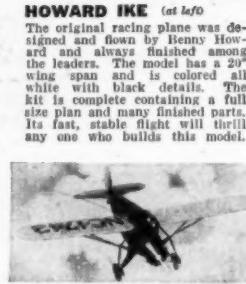
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for Christmas**

SPECIAL HOLIDAY GIFT OFFER



FAIRCHILD CABIN

A beautiful 20" wing span model in two colors containing all of the perfect flying qualities of the original. Can easily be built by any one in a few hours with complete satisfaction. The kit contains full size plans, turned balsa cowling and many other finished parts.



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FUN—Know about the latest model flyers. Get a real kick from watching your ship soar high above, and glide home for a perfect three-point landing.

LEARN—to build racers—cabin planes—big transports—fighters—bombers. Know about wing-stresses—lifting—dihedral—whirlwind motors. Study the gas jobs powered with tiny 1/5 H.P. motors—own your own that will fly 25 minutes.

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\$150

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SECOND—your choice of either of the two complete Construction kits to build the popular 20" flying models shown at the left, the Howard Ike and Fairchild Cabin. These kits are complete with all Plans, Instructions and Materials. They are manufactured by a nationally known model airplane concern and retail for 50¢ each.

MODEL AIRPLANE NEWS is written for enthusiasts of PRACTICAL aviation. The editors are experienced technical experts, drawing the finest materials from master builders all over the world—many of the contributors being World's Record holders. 64 pages each month—dozens of models—latest developments—hundreds of photographs of fine ships and enthusiastic model builders.

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City

Check here if Gift Card is to be sent.

Name of Sender

This offer good in the U. S. and Canada. Canadians please add 10¢ to cover kit mailing costs. Offer, excluding kit also good in U. S. pos., Cuba, Mexico, Panama and S. Amer.

Build and Fly A REAL CHAMPION!



JUMPH! On Sept. 5th Britain of Atlanta, wins first prize with his Clipper in Meet sponsored by Atlanta Constitution.

HILL Jack Bietz sets National Senior Record in 1938

and Junior Aviation

at Akron, Ohio!

ONES E. Long of Clarksburg, W. Va., officially broke world's record in open May 28th, 1938, with his Clipper.

W. SCHINDLER, first prize 1938 Baltimore Meet with his Clipper.

MIA KONGES, first place at the Chicago Meet, July 1938.

ROBERT MAZEL, trophy for flight over 4½ feet at Eastern States Contest, Aug. 7th, 1938, and many other firsts and places, too numerous to mention. See the sensational Comet Clipper at your dealer.

PIPPET—

No. E21—25c

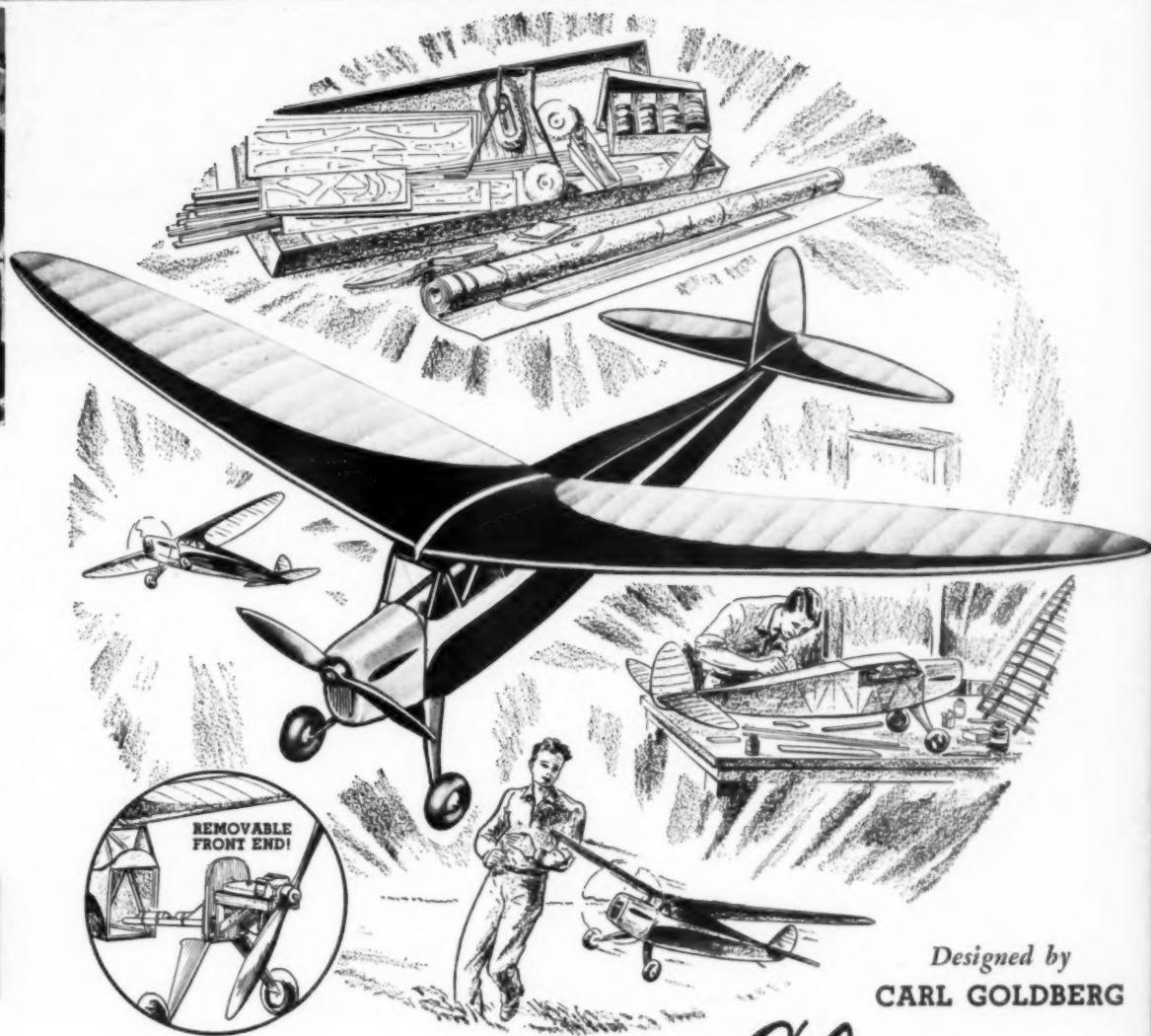
Something new! Put it together and fly it in the evening! Punched fuselage sides, bulkhead, tail, etc., colored red, blue, green and yellow. Kit contains everything needed to build this dandy 18" Comet Clipper—and it flies like a dream! Postage, 15c, none ordered from dealer.



ARTISS PURSUIT—

No. L7—50c

Most authentic model plane recently tested by U.S. Army Corps. Fastest pursuit plane in the world. Performance data a million secret. 37½" wingspan. Postage, 15c, none ordered from dealer.



Designed by
CARL GOLDBERG

 **THE COMET Clipper**

IT DOESN'T take gas model enthusiasts very long to spot a winner! And the Comet Clipper is a consistent prize winner in gas model events throughout the country! More Comet Clippers are flown in contests than any other commercial model—out of 206 entries at the Midwestern States Contest, 12% were Clippers! Features: removable power unit integral with landing gear; wing and tail group separates in event of collision; steep climb and flat glide; easy to build because difficult parts are finished; 6 ft. wingspan. Build and fly this champion of them all!

\$4.95

Kit No. T7—Comet Clipper, including Comet Automatic Timer

Comet Clipper Kit with air wheels..... \$6.50

Postage 25c, none if ordered from dealer.

GAS MODEL PROPELLER

A scientifically designed, beautifully finished propeller for gas models. 14" diameter. 8" pitch. Perfectly balanced. In natural finish.

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